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No. 82-558

In the Supreme Court of the United States

October Term, 1982

LUCERNE PRODUCTS, INC.,
Petitioner,

vs.

SKIL CORPORATION,
Respondent.

ON CERTIORARI TO THE UNITED STATES COURT OF APPEALS
FOR THE SIXTH CIRCUIT

APPENDIX TO PETITION FOR WRIT OF CERTIORARI

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APPENDIX

OPINION OF THE UNITED STATES COURT OF APPEALS FOR THE SIXTH CIRCUIT

(Filed July 7, 1982)

No. 80-3170

UNITED STATES COURT OF APPEALS
FOR THE SIXTH CIRCUIT

SKIL CORPORATION,
Plaintiff-Appellee,

v.

LUCERNE PRODUCTS, INC.,
Defendant-Appellant.

APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF OHIO

Before: MERRITT and JONES, *Circuit Judges*, and PHILLIPS, *Senior Circuit Judge.*

JONES, *Circuit Judge.* This is an appeal from a decision of the district court holding U.S. Patent No. 3,209,228 valid. The report of Magistrate Streepy and the opinion of District Judge Lambros are reported at 489 F. Supp. 1128 (N.D. Ohio 1980). We affirm.

I.

Background

For an extensive discussion of the facts of the case, reference is made to the magistrate's report. A summary of the pertinent facts will be stated in this opinion to the extent necessary to dispose of the issues presented on appeal.

Skil Corporation (Skil) is the owner of U.S. Patent No. 3,209,228 in the name of Alex F. Gawron (the Gawron patent). The Gawron patent claims a combination of elements which include (1) an electric motor, (2) a silicon controlled rectifier (SCR) speed control circuit, (3) a trigger, and (4) human feedback. These elements combine to produce an operator-controlled trigger to regulate the operating speed of a portable power tool, such as an electric drill.

The Gawron patent application was submitted on September 28, 1962. In early 1964, Lucerne Products, Inc. (Lucerne) exhibited a speed control device before Skil officials which, like the speed control device claimed in the Gawron patent application, employed an SCR speed control circuit and a trigger operated through human feedback. The Lucerne device also had an additional desirable feature in that it was available in a "retrofit package" which would permit the speed control device to be inserted in the handle of a portable tool. Although the Gawron patent application had noted that the speed control device claimed therein could be "mounted in a handle," the location or packaging of the speed control device was not an element of the combination patent, and the Gawron patent prototype did not have the speed control elements housed exclusively in the handle of the tool.

Skil and Lucerne entered into negotiations, and on March 2, 1964, Skil ordered 100,000 of the Lucerne speed control switches at $3.00 a unit. Since Lucerne lacked production facilities, Skil assisted Lucerne in their creation and advised Lucerne to make certain refinements in the speed control device.

On March 3, 1964, Skil amended its initial application by cancelling certain claims and adding two new claims. In the supporting remarks, Skil noted that the Gawron device "is small and compact and readily lends itself to mounting within the handle of the tool without causing heating of the handle." Skil further asserted that the Gawron device provided for the first time an extremely compact, trigger-operated control system which could be mounted in the handle of a power tool. On November 24, 1964, the patent examiner denied the amended claims of the Gawron patent application.

On March 26, 1964, Lucerne filed a patent application covering its speed control device. Like the Gawron patent application, none of the claims in the Lucerne patent application included the placing of the speed control circuitry into the handle of a power tool as an element of the claimed invention.

On March 9, 1965, Skil and Lucerne entered into an agreement which provided that counsel for the parties would make a mutual disclosure of their respective patent applications, determine whether there was common subject matter, and, if so, compare proofs as to the date of inventorship. In the event they could not agree as to which party was entitled to the claims, the Patent Office would be requested to set up an interference to determine the same. In the event a patent was issued to either Skil or Lucerne, the party owning the patent would grant to the other party a nonexclusive license to make the control

switch units for a royalty of three percent, or lower in case another license was granted for a lower royalty.

Lucerne subsequently did little to establish prior invention of the speed control device. At the March 9, 1965 signing of the agreement between Skil and Lucerne, the parties disclosed their respective patent applications to one another. On June 30, 1965, Lucerne exhibited its first two trigger speed control device prototypes. Counsel for Lucerne represented that the two prototypes were made before the relevant Gawron invention dates, but no supporting documentation was produced by Lucerne at that time. During the period between early 1966 and August 1977 [sic], Lucerne, for the first time, showed Skil a document in an effort to establish priority of invention. Two additional documents were disclosed to Skil in August of 1967. These documents, however, were inconclusive. The district court found that the Lucerne device was not invented prior to the September 28, 1962 application date of the Gawron patent, and this finding is not challenged on appeal.

On March 16, 1965, Skil representatives met with the patent examiner concerning the Gawron patent application. They demonstrated the Gawron invention by operating a variable speed control drill which incorporated the invention. The invention was embodied in a Lucerne speed control device which Skil had purchased from Lucerne.

Six days after the demonstration before the patent examiner, on March 25, 1965, another amendment to the Gawron application was filed. In the remarks accompanying the amendment, the March 16, 1965 demonstration was acknowledged and briefly described. There is no evidence that Skil, at this or any other time, informed the Patent Office of the Lucerne speed control device and its use in the demonstration drill. Nor is there any evi-

dence that Skil pointed out the retrofit feature of the Lucerne device or otherwise contended that the invention included the retrofit feature as an element. The remarks also sought to distinguish the amended Gawron claims from certain prior art patents. These patents included U.S. Patent No. 2,609,525 (the Gemill patent), which teaches that the speed of an electric appliance can be varied by using a trigger in combination with a circuit which features a rheostat. The patent examiner was shown a copy of the patents and Skil stated that, "None of these patents in any way relate to a trigger speed control using a silicon rectifier circuit, and in particular the type of circuit which permits the operator of the tool to achieve feedback by finger control." On April 6, 1965, the patent examiner reconsidered the Gawron application and allowed it. The Gawron patent was issued on September 28, 1965.

Lucerne sought to amend its application on June 15, 1965, by adding claims which duplicated the claims allowed in the Gawron application. On May 19, 1966, the patent examiner rejected all claims of the Lucerne application. Lucerne filed an amendment on August 4, 1966, and requested that an interference be declared between its amended claims and the Gawron patent. In response, the patent examiner rejected all Lucerne claims on September 9, 1966, and sometime thereafter the application was abandoned.

II.

Fraud on the Patent Office

Lucerne contends that Skil committed fraud on the Patent Office in the prosecution of the Gawron patent application by failing to inform the Patent Office of (1) the Lucerne speed control device, (2) the agreement between

Skil and Lucerne to determine first inventorship, (3) the fact that Gawron's prototype did not have the "retrofit" feature, and (4) the use of the Lucerne speed control device to demonstrate the Gawron invention to the patent examiner.

An initial difficulty with Lucerne's position is its claim that this appeal presents only questions of law and involves no issues of disputed fact. In this Circuit a party asserting a fraud defense in patent litigation is required to prove "specific intent," that is, intent to defraud, by clear, unequivocal and convincing evidence. *Kearney & Trecker Corp. v. Cincinnati Milacron, Inc.*, 562 F.2d 365, 371 (6th Cir. 1977); *Kolene Corp. v. Motor City Metal Treating, Inc.*, 440 F.2d 77, 83 (6th Cir.), *cert. denied*, 404 U.S. 886 (1971). Further, the specific intent must be associated with a material matter. *Schnadig Corp. v. Gaines Mfg. Co.*, 494 F.2d 383, 392 (6th Cir. 1974). Whether clear, unequivocal and convincing evidence of fraud was in the record before the district court is a question of fact, not of law, and thus the determination of the district court that there was no fraud may be reversed only if clearly erroneous. *Kearney & Trecker Corp. v. Cincinnati Milacron, Inc., supra* at 371; *Schnadig Corp. v. Gaines Mfg. Co., supra* at 392; *Becton Dickinson & Co. v. Robert B. Scherer Corp.*, 211 F.2d 835, 838 (6th Cir. 1954). Lucerne's contention that, upon the facts found, the district court was required to conclude that Skil committed fraud as a matter of law must be rejected.

The district court found that Lucerne had established neither the specific intent nor the materiality elements of the fraud defense. This finding was not clearly erroneous. A finding of fraud on the Patent Office depends on a subsidiary finding that the omission or misrepresentation was material. *DeLong Corp. v. Raymond Interna-*

tional, Inc., 622 F.2d 1135, 1145 (3rd Cir. 1980). Where, as here, the claim is one of fraudulent nondisclosure, it must appear that the Patent Office would have rejected the patent application but for the nondisclosure. *Deere & Co. v. Hesston Corp.*, 593 F.2d 956, 960 (10th Cir.), *cert. denied*, 444 U.S. 838 (1979); *Norton v. Curtiss*, 433 F.2d 779, 795 (C.C.P.A. 1970). Since Lucerne does not challenge the district court's finding that its device was not prior art, its insistence that Skil was duty bound to bring the device to the attention of the Patent Office is inexplicable. Obviously, the existence of a similar device invented at a later date would not have caused the Patent Office to reject Skil's patent application, and therefore was not material.

Since the existence of the Lucerne speed control device was not material to the patentability of the Gawron invention, it follows that the agreement between Skil and Lucerne to determine first inventorship and the use of the Lucerne speed control device to demonstrate the Gawron invention was also immaterial. Similarly, the fact that the Gawron prototype did not have a retrofit feature is utterly immaterial. An inventor need not make an actual reduction to practice; the filing of an application is a constructive reduction to practice which completes the invention.[1] *The Telephone Cases*, 126 U.S. 1, 535-36 (1888); *Republic Iron & Steel Co. v. Youngstown Sheet & Tube Co.*, 272 F. 383, 391 (6th Cir. 1921).

On appeal, Lucerne seeks to avoid the consequences of the finding that its device was not prior art by contending that Skil was required to disclose the Lucerne device

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1. Although neither the Skil nor the Lucerne applications claime the retrofit feature as an element of the claimed invention, the original Skil application, filed well before Skil learned of the Lucerne device, clearly stated that the Gawron invention could be mounted "in the handle" of a power tool.

merely because Skil could not be sure whether the Lucerne device was in fact invented after the Skil device. Lucerne relies on the "unconpromising duty" of candor discussed in *Precision Instrument Mfg. Co. v. Automotive Maintenance Machinery Co.*, 324 U.S. 806 (1945). In *Precision*, however, the nondisclosure condemned by the Supreme Court was highly material: the party seeking to enforce the patent knew that the patent had been acquired by means of perjury regarding the date of invention. Similarly, in every case in which this Court has applied the *Precision* doctrine, we have recognized that the lack of candor or inequitable conduct must relate to a material matter. *See, e.g., Buzzelli v. Minnesota Mining & Mfg. Co.*, 521 F.2d 1162, 1166 (6th Cir. 1975); *Schnadig Corp. v. Gaines Mfg. Co.*, 494 F.2d 383, 392-93 (6th Cir. 1974); *Charles Pfizer & Co. v. FTC*, 401 F.2d 574, 580, 582 (6th Cir. 1968), *cert. denied*, 394 U.S. 920 (1969). Thus, *Precision* does not impose upon the patent applicant a duty to disclose immaterial facts. *Cf. Carter-Wallace, Inc. v. Davis Edwards Pharmaceutical Corp.*, 443 F.2d 867, 881 (2d Cir. 1971) (*Precision* doctrine would not require disclosure of certain references if references not found to be prior art). Lucerne's reliance on *Beckman Instruments, Inc. v. Chemtronics, Inc.*, 428 F.2d 555 (5th Cir.), *cert. denied*, 400 U.S. 956 (1970), is also misplaced. There the court's discussion of Beckman's duty to disclose the existence of Chemtronic's device is premised on a finding that Chemtronic's invention was prior art. Lucerne, however, has acquiesced in a finding that its invention was *not* prior art. Thus, the cases relied on by Lucerne do not permit it to evade the materiality requirement.

Apart from the claims relating to the nondisclosure of the Lucerne device, Lucerne further contends that Skil fraudulently misrepresented the Gemill patent as not relat-

ing to a trigger speed control permitting operator feedback by finger control. However, Lucerne has misread Skil's statements. Although the Gemill patent does teach the elements of speed control, human feedback, and the use of a trigger, its circuitry features a rheostat rather than an SCR, and it is on this basis that Skil distinguished the Gemill patent. Thus Skil did not misrepresent the Gemill patent, fraudulently or otherwise.

III.

Obviousness

The district court adopted the magistrate's conclusion that the Gawron invention was nonobvious. On appeal, Lucerne again insists that the Gawron patent is directed to obvious subject matter and invalid under 35 U.S.C. § 103.

The Gawron patent has been held nonobvious in *Skil Corp. v. Cutler-Hammer, Inc.*, 412 F.2d 821 (7th Cir.), *cert. dismissed*, 396 U.S. 951 (1969). In that litigation, the district court had found the Gawron patent invalid for obviousness, relying upon the rejection by the Patent Office of identical claims contained in the Lucerne application. The Seventh Circuit reversed, holding that a rejection of the Lucerne application did not destroy the presumption of validity of the Gawron patent. The difference of about a year and a half between the Gawron application and the later Lucerne application was considered significant by the court because the art of silicon-controlled rectifiers was rapidly advancing during that interval. 412 F.2d at 824.

The normal statutory presumption of validity accorded to a patent by 35 U.S.C. § 282 is greatly enhanced when it has been held valid in a prior decision. *American Home Products Corp. v. Lockwood Mfg. Co.*, 483 F.2d 1120, 1125 (6th Cir. 1973), *cert. denied*, 414 U.S. 1158 (1974). A

prior adjudication of validity will be followed unless the court is convinced of a very palpable error in law or fact. *Id.; Cold Metal Process Co. v. Republic Steel Corp.*, 233 F.2d 828, 837 (6th Cir.), *cert. denied*, 352 U.S. 891 (1956).[2]

Lucerne relies upon the rejection by the Canadian Patent Office of the corresponding Gawron application on the grounds of obviousness.[3] The magistrate, however, found that no evidence was introduced showing that in 1965 Canadian patent law was substantially identical to United States patent law or that the facts and circumstances surrounding the two applications were substantially identical. Furthermore, we note that the three year interval between the American and Canadian filing dates[4] is twice as long as the period considered significant by the Seventh Circuit in holding that rejection of the Lucerne application did not detract from the validity of the Gawron patent. Therefore, we conclude that the magistrate and the district court did not err in concluding that the proceedings in Skil's Canadian application did not overcome the enhanced presumption of validity attaching to the Gawron patent.

The judgment of the district court is AFFIRMED.

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2. Lucerne contends that the precedential effect of the Seventh Circuit decision has been nullified by the supplemental record developed in the course of this litigation. However, the eight items of new evidence upon which Lucerne relies pertain to the alleged fraud practiced by Skil, an allegation we have rejected. These items of evidence do not undermine the Seventh Circuit decision on the issue of obviousness.

3. Patent proceedings in other countries are not controlling, in part because the standards of patentability vary widely from country to country. *Timely Products Corp. v. Arron*, 523 F.2d 288, 295 (2d Cir. 1975). But in light of the emphasis Lucerne places upon the Canadian patent proceedings, it is interesting to note that Skil did succeed in obtaining counterpart Gawron patents in eleven other foreign countries.

4. As mentioned, the United States patent application was submitted on September 28, 1962. The Canadian patent application was filed on September 21, 1963.

REPORT AND RECOMMENDED DECISION OF MAGISTRATE OF THE UNITED STATES DISTRICT COURT

(Filed March 9, 1979)

Consolidated Cases Nos. C69-461 and C74-121

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO
EASTERN DIVISION

SKIL CORPORATION,
a corporation,
Plaintiff,

vs.

LUCERNE PRODUCTS, INC.,
a corporation,

and

BENJAMIN H. MATTHEWS,
an individual,
Defendants.

This consolidated action was referred to the magistrate, with consent of the parties, to conduct pretrial and trial proceedings as a master, pursuant to 28 U.S.C. § 636. Based upon the evidence taken during a twenty-one day trial I recommend the following. References to the record are not exhaustive. Any matter set forth in the Discussion and Conclusions of Law deemed to be a Finding of Fact is hereby incorporated into its appropriate designation.

FINDINGS OF FACT

The Actions and the Parties

1. The issues in this consolidated action revolve around two patents owned by the plaintiff, Skil Corporation (Skil). Those patents are: (1) U.S. Patent No. 3,209,228, in the name of Alex F. Gawron (the Gawron patent), titled "System For Contrclling Electric Motors In Power Tools and The Like" (Plaintiff's Exhibit, hereafter PX, 1); and (2) U.S. Patent No. 3,260,827 in the name of Carl J. Frenzel (the Frenzel patent), titled "Motor Reversing Mechanism For Electrically Powered Portable Tools" (PX 24). Mr. Gawron and Mr. Frenzel have assigned their respective patents, and all rights therein to Skil (PX 3, 26; Pretrial Stipulation, hereafter Stip., paras. 12, 13).

2. In action C69-471 Skil has sued Lucerne Products Inc. (Lucerne) and Mr. Benjamin H. Matthews for royalties in a four count complaint. The parties are of diverse citizenship (Stip., paras, 1, 2, 6). The complaint essentially contends that Skil entered into licensing agreements with the defendants concerning the Gawron and Frenzel patents,

that the defendants have failed to pay due owing royalties, and that the defendants have erroneously contended that certain devices which they manufacture are not covered by the patents.

3. In action C74-121 Skil has sued Lucerne; Mr. Matthews; the Millers Falls Company (Millers Falls), now a division of defendant Ingersoll-Rand Company; Wen Products, Inc. (Wen); and Rockwell Manufacturing Company, now Rockwell International Corporation (Rockwell). The action is a one count complaint alleging that the defendants have infringed the Gawron patent.

4. In their responses to the complaints the defendants have raised numerous issues, including whether the Gawron and Frenzel patents are valid, whether there has been infringement of the Gawron patent, whether certain devices are covered by the Gawron and Frenzel patents, whether Skil committed fraud upon the Patent Office in obtaining the Gawron and Frenzel patents, whether Skil engaged in patent misuse concerning the Gawron and Frenzel patents, and whether Skil legally declared the license agreement concerning the Gawron patent to be cancelled.

THE GAWRON PATENT

Nonobviousness

5. The Gawron patent consists of four claims. Each claim is a combination of elements which includes: (1) an appropriate electric motor, (2) a silicon controlled rectifier (SCR) speed control circuit, (3) a trigger, and (4) human feedback. These elements are combined to achieve the desired goal of speed control, which, as applied to a universal motor driven hand drill, is comprised of three distinct elements: (1) original selection of an appropriate drill speed (rpm) for a particular drilling operation; (2)

maintaining that drill speed during operation as the load on the drill varies; and (3) changing the original drill speed while the drilling operation is being performed if a second drill speed becomes more appropriate. The SCR speed control circuit permits the drill to be operated within a relatively wide range of speed. Manipulating the trigger sets the desired speed. Once the drilling begins the operator's human senses (human feedback) tell him whether he should maintain the initial drill speed, increase it, or decrease it. As the load varies on the drill human feedback also tells the operator how to manipulate the trigger in order to maintain the desired constant speed (PX 1).

6. As of September 28, 1962, the date of the Gawron patent application, the scope and content of the prior art included the following:

(a) Gemmill patent (Gemmill) No. 2,609,525, (PX 2A; Defendants' Exhibit, hereafter DX, 32), which teaches that the speed of an electric appliance, such as a food mixer, can be varied by using a trigger in combination with a circuit which features a rheostat. The desire speed for the food mixer is obtained and maintained by human feedback (T 982-983).

(b) An SCR manual (SCR manual) published by the General Electric Company (DX 40), which teaches that since 1957, in hundreds of different jobs, the SCR has replaced certain components, including rheostats (*Id.*, p. ii).

(c) Slater patent (Slater) No. 3,103,618 (PX 2A; DX 35), which teaches that an SCR circuit can be used in a switch to vary the dimming of a lamp by utilizing a knob to set the desired level of dimming.

(d) Australia patent (Australia) No. 242,179 (PX 2A), which teaches that an SCR circuit can be used in

a portable electric drill to vary the drill speed by combining a knob, to set the desired speed, with a built-in speed regulating circuit, to maintain that speed.

(e) An article by F.W. Gutzwiller (Gutzwiller) titled "Universal Motor Speed Control", published by the General Electric Company (PX 2A; DX 37, 38), which teaches that SCR circuits can be used to obtain a range of motor speeds, and that if constant speed is desired with a varying load an SCR circuit with inherent feedback is required.

7. The difference between the prior art and the claims of the Gawron patent is as follows:

(a) Gemmill teaches the elements of speed control, human feedback (T 982-983), and use of a trigger; however, its circuitry features a rheostat rather than an SCR. Moreover, the Gemmill rheostat speed control circuit cannot be used in an electric hand drill (T 1047, 2419-2420, 2905-2907).

(b) Although Gutzwiller reveals the SCR circuit which is utilized by the Gawron patent (DX 37, pp. 2-3; T 978-980), it does not teach that the circuit can be utilized to achieve essentially constant speed characteristics with a varying load, nor does it teach the use of a trigger.

(c) Slater relates to a dimming switch rather than the speed of a hand driven motor, and does not mention varying load conditions. Moreover Slater alters the voltage and current being applied by means of utilizing a knob to preset the desired level, rather than by utilizing human feedback with a trigger to reach the desired level during operation.

(d) Australia teaches an SCR circuit being utilized in a portable electric drill, but teaches use of automatic, or inherent, feedback rather than human feedback. Aus-

tralia uses a knob to preset the desired speed and relies upon the inherent feedback circuit to maintain that speed; whereas Gawron does not preset the desired speed, rather it uses a trigger to reach the desired speed and relies upon human feedback to maintain that speed during operation of the drill.

(e) The SCR manual does not refer to the elements of human feedback, use of a trigger to achieve speed control, nor even speed control.

8. It is possible to combine the Gemmill feedback device with the relevant Gutzwiller SCR circuit to create the claims of the Gawron patent (DX 32, 173; T 2185-2214). The factual issue is whether this combination of elements was within the level of ordinary skill in the art as of September 28, 1962. That level of skill was as follows.

(a) The Gemmill patent was issued in 1952 (DX 32, p. 1). SCR's were not introduced on the market until 1957 (DX 40). No suggestion has been made that Mr. Gemmill was skilled in the art of SCR circuitry.

(b) Mr. Gutzwiller did possess expertise in the art of SCR circuitry, as reflected in his 1961 prior art publication (DX 37, 38; PX 2A). An essential element of the inventive concept of the Gawron patent is set forth in the last full paragraph of the specification prior to setting forth the claims, which reads as follows (PX 1):

> As it is apparent to those skilled in the art, the circuit shown and described does not have inherent speed feedback. However, essentially constant speed under varying load conditions can be readily obtained by manipulation of the trigger which is under the operator's control at all times during operation of the tool.

This quoted paragraph of the Gawron patent is diametrically opposed to the teaching of Gutzwiller, which taught that to achieve essentially constant speed with the application of a varying load an SCR speed control circuit with inherent feedback was required (T 1001, 1050-1052). This interpretation of Gutzwiller is readily apparent from an analysis thereof:

(1) Gutzwiller describes four SCR circuits. One circuit, that which is utilized in the Gawron patent (T 978-980), does not have inherent, or automatic, feedback. The other three Gutzwiller circuits do have this feature. Gutzwiller distinguishes between the benefits of SCR circuits: (1) all four circuits ". . . can be used wherever a wide range of speed is required. . . ."; whereas (2) as to the three circuits with "inherent speed feedback", they are also capable of providing ". . . essentially constant speed characteristics adequate for many types of applications over a wide range of speed." (DX 37, p. 1).

(2) Gutzwiller's first SCR circuit, that without inherent speed feedback, is incorporated in the Gawron patent. With regard to this circuit, Gutzwiller notes (*Id.*, p. 3):

> As it stands, this circuit is handicapped by the well-known drooping speed-torque characteristic of series motors. As load is increased, the motor slows down markedly, and if load is removed, the motor runs up to a high speed. To achieve essentially constant speed characteristics with varying load, some type of feedback is necessary for a series motor control. The following three circuits achieve feedback. . . .

The three SCR circuits which solve this problem are those which contain inherent speed feedback.

(3) In comparing the four SCR circuits under the heading, "Speed Regulation & Stability Performance" Gutzwiller rates the first circuit, that without feedback, as "Poor (no feedback)". The other three circuits, those with inherent feedback, are rated as "limited", "good", or "best" (*Id.*, p. 8).

(4) It is evident from the above discussion that what separates the first circuit, that without inherent feedback, from the other circuits is the ability of the latter to "achieve essentially constant speed characteristics with varying load". Gutzwiller is clearly stating that only those circuits with inherent feedback are capable of achieving this feature. The Gawron patent requires constant drill speed under varying load, hence Gutzwiller teaches that inherent feedback SCR circuits are required in a Gawron patent device.

(5) Gutzwiller included the first circuit, that which does not have the inherent feedback necessary to achieve essentially constant speed characteristics with varying load, because his publication does not appear to be limited to uses which required constant speed capability. He lists nine categories of typical uses for the SCR circuits, including food mixers, hand tools, process machinery, movie projectors, machine tools, home appliances, conveyor systems, fans, and hobby and toy applications (*Id.*, p. 1). With such a wide variety of suggested uses it would not be surprising that at least one of them only requires the capability of achieving a wide range of speed, without the additional capability of maintaining constant speed under the application of a varying load.

(c) No evidence was offered at trial to suggest that as of September 28, 1962 Gutzwiller did not reflect the level of ordinary skill in the art of SCR circuits. Accordingly, the ordinary skill in the art of SCR speed control

circuits as of September 28, 1962, taught that to achieve essentially constant speed under the application of varying load an SCR speed control circuit with inherent feedback capability was required. No evidence was offered to show it was obvious to the appropriate mechanic of ordinary skill as of September 28, 1962, to combine Gemmill with Gutzwiller's first SCR circuit as a means of achieving constant speed under varying load.

9. On September 21, 1965, Mr. Gawron filed an application for a patent in Canada (DX 41, p. 1). During the course of the proceedings the agents for Mr. Gawron stated that claims 1 to 4 of the Canadian application were virtually identical with the claims of the United States Gawron patent (*Id.*, p. 18). The application was eventually rejected as being within the expected skill of one versed in the art (*Id.*, pp. 75-79).

(a) No evidence was introduced showing that in 1965 Canadian patent law was substantially identical to United States patent law, or that the facts and circumstances surrounding the Canadian application were substantially identical to those surrounding the Gawron application before the United States Patent Office.

10. Skil entered into licensing agreements concerning, among other patents, the Gawron patent. Thus Skil contracted with Arrow-Hart Inc., beginning in 1965 (PX 115), the Milwaukee Electric Tool Corp. in 1966 (PX 113), McGraw-Edison Company in 1966 (PX 114), Singer Company in 1967 (PX 117). Black & Decker Manufacturing Company in 1971 (PX 118), and defendant Millers Falls Company in 1975 (PX 116). Generally speaking, the royalty rates under these licensing agreements ranged between three and four percent. Skil has received in excess of one million dollars in royalties on the Gawron patent (PX 119E; T 700-701), and since 1964 it has sold approxi-

mately one hundred million dollars worth of products which embody the Gawron patent (PX 136, 137, 138; T 615-616).

11. Skil filed an action for infringement of the Gawron patent in the United States District Court for the Northern District of Illinois, and on June 28, 1968, the court ruled the Gawron patent invalid (PX 111; *Skil Corporation v. Cutler-Hammer, Inc.*, 159 U.S.P.Q. 423 (N.D.Ill. 1968)). This ruling was appealed and on June 12, 1969, the Seventh Circuit Court of Appeals reversed, ruling that the Gawron patent was valid (PX 111; *Skil Corporation v. Cutler-Hammer, Inc.*, 412 F.2d 821 (7th Cir. 1969)).

First Inventorship

12. Mr. Gawron began working for Skil in 1960 as an engineer in research and development (T 59). He filed his application for what later became the Gawron patent on September 28, 1962 (PX 2).

13. In the latter part of 1960 Mr. Matthews began investigating, on behalf of Lucerne, possible functions of the switch used to turn portable power tools on and off. (DX 155). By December 23, 1960, this investigation had evolved into a "speed control project" which was being worked on by Mr. Matthews and Mr. Jules F. Rhine (DX 156, T 2238-2239). Their efforts eventually produced, independent of the efforts of Mr. Gawron, the invention set forth in the Gawron patent. A critical issue is the date on which they reduced their speed control device (the Lucerne speed control device) to practice.

14. Both Mr. Rhine and Mr. Matthews testified they first successfully operated a drill with the Lucerne speed control device during the week between Christmas of 1960 and New Years Day of 1961. Mr. Rhine testified they "stuffed" the device into a Ram drill, which "did operate"

(T 2261), and that upon pulling the drill trigger they "did achieve control" and "did vary the speed of the drill" (T 2315-2316). Mr. Matthews testified that as the trigger was pulled the drill "would start slowly and get faster and faster and faster". He noted the device varied the motor's speed "Continuously." (T 2543).

(a) This testimony comprises the entire description of the 1960 testing of the speed control device. None of the details or surrounding circumstances were described.

(b) An electric hand drill with a speed control device must be capable of drilling into wood, plastic, metal and other materials. It must also be able to withstand rough treatment (T 3472-3473). The Lucerne testing did not indicate any drilling into appropriate material.

(c) The Lucerne testing did not indicate that a varying load was applied to the drill as it was being operated.

15. Despite viewing the 1960 test as "a landmark", which represented something they "had been trying to do for many years", not one piece of paper was introduced which referred to that test. Mr. Matthews' explanation for this failure was that ". . . we don't keep records like that." (T. 2625).

16. Mr. Rhine and Mr. Matthews testified they demonstrated the Lucerne speed control device to three other individuals (T 2436, 2544).

(a) Not one of these individuals was called to corroborate or describe the alleged demonstration, although it appears their testimony would have been relevant (DX 9, pp. 27, 45, 52).

(b) There is no evidence that any of these individuals were peculiarly within the control or power of the defendants to produce them at trial.

17. The only relevant Lucerne document which arguably shows the Lucerne speed control device circuitry was drawn by Mr. Matthews and dated July 6, 1961 (DX 158). This crude drawing admittedly was in error since it would cause a short circuit as drawn (T 2550-2551).

18. The first Lucerne speed control device, that which allegedly operated the Ram drill in 1960, was subsequently altered, thus the original is no longer in existence (T 2236, 2247, 2545-2546, 2872-2874). In its altered form it was introduced into evidence (DX 16). The device as altered was not demonstrated at trial to be operable.

(a) Mr. Rhine and Mr. Matthews did not agree as to the period of time during which alterations were made to the original device, Mr. Matthews stating they occurred from 1960 to some time in 1962 (T 2874), Mr. Rhine testifying they were made from 1960 to the fall of 1963 (T 2247).

(b) A tag attached to the altered Lucerne speed control device reads in part, "November 1960" (DX 16). Mr. Matthews testified he wrote this tag and attached it to the original device in November of 1960. Upon further examination he testified that since the first device was constructed in December of 1960 he put the tag on at that time, but wrote "November 1960" since that represented when he had received the SCR for the device (T 2618-2620). He indicated confusion as to the precise month and year that he obtained certain components of the device, and conceded that picking out the month was "a little difficult" (T 2822-2829). This tag has followed along with the speed control device during all its later modifications. Mr. Matthews acknowledged it was possible, but not probable, that the tag could have got "fouled up" at some time (T 2620-2625).

(c) A photograph taken prior to August 3, 1966, of the first model of the Lucerne speed control device does not show the tag which is now attached to it (DX 9, pp. 61, 64, 66; T 2913-2916).

19. Mr. Rhine testified that he worked on a second model or prototype of the Lucerne speed control device during the 1961 through 1963 time period (DX 17; T 2267-2269). He did not know whether the original parts remained on the device (T 2271). Mr. Matthews testified that ". . . we made it [DX 17] and it worked, and it was put away." He further testified that no changes were made in its components (T 2632-2633). No other evidence of testing was offered concerning this model.

(a) Attached to the second model of the Lucerne speed control device is a tag which reads in part "Feb. 1962" (DX 17). Mr. Matthews testified he wrote this on the tag at about the time it was made (T 2614). Mr. Rhine could not identify this tag (T 2274).

(b) A photograph of the second model does not show the tag which is now attached to it (DX 9, pp. 61, 64, 66; T 2913-2916).

(c) One of the components of the second model is an SCR with the legend on it "GE C15B 252" (DX 17). Although Mr. Matthews testified that it was the original component of the second model, assembled some time in February of 1962, there is other evidence that the legend shows the SCR could not have been manufactured before the last week of December, 1962 (Plaintiff's Rebuttal Exhibit, hereafter PXR 50, pp. 14-15, 18-19, 33-34; PXR 52).

20. Three additional physical devices (DX 19, 20, 21) were introduced to show various stages of development of the Lucerne speed control device. The tags attached to these devices indicate they were developed subsequent to 1961 (*See also* T 2285, 2291-2292, 2298).

21. There is no clear and convincing evidence that the Lucerne speed control device was tested prior to September 28, 1962, in such a way as to demonstrate its practical utility for its intended purpose.

22. Assuming Lucerne achieved a reduction to practice in December of 1960, it did not disclose its speed control device to the trade until approximately 36 months thereafter, in late 1963 or early 1964. During this 36 month period Lucerne was seeking to achieve a retrofit package for its speed control device which would sell for no more than $3.00. A retrofit package is described as housing the speed control components inside a casing which can be directly placed in the location previously utilized by the normal on/off trigger switch in a hand held electric drill (T 1591-1592, 1625, 2262-2263, 2284-2285, 2562-2563, 2913, 2943-2944).

23. Lucerne did not file a patent application concerning either its speed control components or its retrofit package until it was prompted to do so upon learning in early 1964 that Skil had a patent application on file (T 2911).

(a) The Lucerne patent application of March 26, 1964, contained eight claims, none of which referred to placing the speed control circuitry into the handle of an electric drill or of achieving a retrofit package (DX 9, pp. 12-14). The Lucerne patent application specification did note that, "Although not herein disclosed . . . [certain] components of the instant embodiment of control circuit may be constructed of such size as to enable the same to be 'miniaturized' . . . so as to enable the complete circuit to be placed within the housing of the motor as, for example, in the handle of the portion of a portable type of power drill or saw." (*Id.*, pp. 10-11).

The Conduct of Skil

24. Mr. Gawron began work on his invention in 1962, and in the summer thereof he constructed a prototype speed control circuit which he placed into a drill. He later filed his patent application on September 28, 1962 (T 72, 76-77; PX 4).

25. Mr. Gawron continued work on his invention after filing his application, in part seeking an economically feasible method to place his SCR speed control invention into an electric hand drill. During this period Mr. Matthews and Mr. Rhine were independently seeking to reach the same goal.

26. On December 3, 1963, the patent examiner rejected all five claims of the Gawron patent application (PX 2, p. 13).

27. Mr. Matthews and Mr. Rhine were eventually able to achieve a retrofit package for the Lucerne speed control device, and in January of 1964 Lucerne began to demonstrate it to various companies, including Skil in Chicago, Illinois (T 2572-2573).

28. Lucerne left a sample of its speed control device with Skil. Mr. Gawron subjected it to a series of tests, and submitted a report on his testing (DX 67).

(a) Some differences between the Lucerne device and the design of a Skil speed control device were noted, but there were also many similarities. In comparing the two controls Mr. Gawron stated in part (*Id.*, pp. 3-4):

> Reason for SKIL controlled design-exclusive design. By keeping design in our own Engineering Department, we can move faster and keep competition in the dark about the approach we are taking. By keeping the design here we would not be helping Lucerne

in the further development of this control. Lucerne has not demonstrated any special 'know how' or engineering talent that we do not possess here. By keeping design here we can gain more knowledge on these controls which should be useful in future products. Reasons against SKIL control design - Would consume additional Engineering man-hours. SKIL would have to assume tooling cost.

Mr. Gawron recommended that Skil evaluate the necessary tooling cost for a new trigger control design and estimate the additional time to design same.

(b) The Lucerne speed control was the only device known to Mr. Gawron in February of 1964 that was completely encased in a housing which could be mounted in the handle of a drill. His prototype (PX 4), which was the only physical embodiment of his invention that he had constructed, did not have the speed control elements exclusively housed in the handle of the tool. A subsequent design also was not housed exclusively in the tool handle (T 962-964, 996-997). Mr. Gawron was aware in February of 1964 that the Lucerne speed control device he tested embodied the subject matter of his patent (T 451).

29. The Lucerne speed control device also prompted two memoranda in February of 1964 from Mr. Frank Kaman, who either was, or was about to become, a vice-president of Skil. The memoranda were dated February 6 and February 20 of 1964. The first memo was directed to eight Skil employees, including its president, assistant to the president, chairman of the board, and general counsel (DX 1, 2; T 1177-1178). Mr. Kaman described the desirability of an innovative trigger type speed control, and Skil's efforts to achieve this goal. The retrofit package of the Lucerne device was an attractive feature

which Skil did not have. His major concern was directed toward the potential competitive threat of the Lucerne speed control device to Skil's goal of achieving a unique position or innovation in the field of trigger speed control. He proposed various methods, either singularly or in combination, and sometimes in rather blunt language, to maintain an exclusive position for Skil:

(a) Skil could proceed independently of Lucerne with its own development. He recommended this approach be rejected since the Lucerne device was the most feasible method for Skil to put the Gawron invention into production (DX 1, 2).

(b) Skil could join forces with Lucerne. This approach was recommended after considerable study of the alternatives (DX 2).

(c) Mr. Kaman felt that "there is a chance" the Gawron patent date "may precede" the Lucerne activities, thus Skil "may prevail over Lucerne on this basis alone." (DX 1). He felt that the Gawron patent "affords some encouragement as to the novelty" of Skil's efforts, but Skil did "not have positive assurance as to the breadth of coverage" afforded by that patent. Nonetheless there was "no reason to downgrade the originality of" Skil's patent efforts. Skil could inform Lucerne of its patent position and warn there would be legal consequences if Lucerne did not join forces with Skil (DX 2).

(d) Skil could offer to give Lucerne business in other areas as inducement to obtain exclusive production rights from Lucerne (DX 2).

(e) Skil could inform Lucerne of the fact certain improvements were required before its device could be placed into production (DX 1, 2).

(f) Skil could order a sufficient number of Lucerne's speed control device units to saturate its production (DX 1, 2).

(g) Skil could acquire the Lucerne corporation, but such an acquisition was not desirable for the sole purpose of acquiring exclusive possession of the Lucerne speed control (DX 1, 2).

30. Skil personnel, including Mr. Kaman, had numerous communications with Lucerne personnel, concerning the Lucerne design, including a trip to the Lucerne plant in Ohio (T 2573-2577).

31. Skil and Lucerne entered into negotiations, and on March 2, 1964, Skil ordered 100,000 of the Lucerne speed control switches at $3.00 apiece (DX 3, T 2578-2579).

(a) At the time of the purchase order Lucerne did not have production facilities to manufacture its speed control device. Skil assisted Lucerne in the large undertaking of creating the necessary production facilities, in part by supplying two tool and dye makers for a period of approximately three weeks at the Lucerne production plant (T 2408-2411, 2582-2585).

(b) Skil insisted on a zero start capability in the speed control and made other suggestions (T 1637-1638, 2410, 2591-2593, 2605-2606).

32. On March 3, 1964, Skil amended its initial application by canceling original claims 1, 2 and 5 and adding new claims 6 and 7 (PX 2, pp. 15-19). In the supporting remarks Skil noted in part that Mr. Gawron's electrical control system ". . . is small and compact and readily lends itself to mounting within the handle of the tool without causing heating of the handle." It also noted that Mr. Gawron's invention for the first time provided

an extremely compact trigger operating control system ". . . which may be readily mounted in the housing of a power tool, such as the handle of an electric drill, for example." (*Id.*, p. 18).

(a) There is no evidence that either Mr. Gawron of Skil informed the Patent Office of the Lucerne speed control device.

(b) The prototype drill of Mr. Gawron did not locate the SCR speed control circuitry in the drill handle (T 964-965), and three of the five originally filed patent claims did not limit the circuitry to the drill handle. Original claim three, however, did refer in part to ". . . said motor and devices connected in series therewith being mounted on a handle, and a trigger on said handle connected to. . ." (PX 2, 7). The originally filed specification stated in part that the invention related generally to electric motor control systems and had "particular relation to . . . a universal motor driven hand drill. . ." (*Id.*, p. 1). It further noted that ". . . the control devices associated with the silicon controlled rectifier [SCR] 15 and the silicon controlled rectifier [SCR] 15 itself can be mounted in a handle or other convenient portion of the tool. . ." (*Id.*, p. 4). The diagram accompanying the original application showed the speed control circuitry as being mounted in the handle of a tool (*Id.*, p. 12).

(c) The Gawron invention does not include instructions or specifications as to how a physical assembly of the SCR speed control can be constructed (T 996-997). Rather, the invention sets forth a combination of elements necessary to accomplish speed control and the location or packaging of the SCR circuitry is not an element of that combination.

33. Production facilities at Lucerne were sufficiently completed to permit manufacturing of the Lucerne speed

control device, designated Model TSC 113 or 114, in the spring of 1964 (T 1295, 1959-1596). After the original purchase order was filled, by May of 1965, Skil issued additional purchase orders to Lucerne for its TSC 113/114 model (T 1341), including a second order for another 100,000 switches at $2.35 apiece (T 2607).

34. On November 24, 1964, the patent examiner rejected the remaining claims of Mr. Gawron's patent application (PX 2, pp. 20-21).

35. Attorneys for Skil and Lucerne began negotiations with reference to a potential agreement concerning the exchange of information proving priority of invention dates (DX 12, 14).

36. Negotiations culminated in an agreement dated March 9, 1965, between Skil and Lucerne, which included the following (PX 98):

(a) The agreement was entered into by reason of the pending patent applications of Skil and Lucerne, which applications ". . . may have claims to common subject matter or may support claims to common subject matter, . . .", and the parties' desire to avoid a Patent Office interference and "decide between themselves as to which party is entitled to any patent. . . ."

(b) The attorneys would make a mutual disclosure of the respective patent applications, determine whether there was common subject matter, and, if so, compare proofs as to date of inventorship.

(c) In the event they could not agree as to which party was entitled to the claim or claims as to common subject matter the Patent Office would be requested to set up an interference to determine same.

(d) In the event a patent was issued to either Skil or Lucerne the party owning the patent would grant to the

other party a nonexclusive license to make the speed control switch units for a royalty of three percent, or lower in the event another license was granted for a lower royalty. It was the duty of the licensor to sue infringers of whatever patent may be obtained.

37. At the March 9, 1965, signing of the agreement the parties disclosed their respective patent applications to each other (T 2949).

38. Ten days after the license agreement was entered into, on March 16, 1965, Mr. Kaman and an attorney for Skil met with the patent examiner concerning the Gawron patent application. They demonstrated the Gawron invention by operating a variable speed control drill which incorporated the invention. The invention was embodied in a Lucerne speed control device which Skil had purchased from Lucerne (T 1321-1328).

39. Six days after meeting with the patent examiner, on March 25, 1965, another amendment to the Gawron application was filed (PX 2, pp. 22-24).

(a) In the remarks accompanying the amendment the March 16, 1965, meeting was acknowledged and briefly described (*Id.*, pp. 24-26). There is no evidence showing that (1) the patent examiner was informed that the demonstration drill contained a Lucerne speed control device, or that (2) Skil pointed out to the examiner the retrofit feature of the Lucerne device or otherwise contended that the invention included the retrofit feature as an element.

(b) The remarks also contained argument seeking to distinguish the Gawron claims, as amended, from certain prior art patents, which included the Gemmill patent. The patent examiner was shown a copy of these patents, and with reference thereto it was noted that, "None of these patents in any way relate to a trigger speed control

using a silicon control rectifier circuit, and in particular the type of circuit which permits the operator of the tool to achieve feedback by finger control." (*Id.*, p. 26).

40. Two weeks later, on April 6, 1965, the patent examiner reconsidered the Gawron application and allowed it (*Id.*, p. 30).

41. On May 20, 1965, Mr. Gawron executed a supplemental oath, stating in part that ". . . he does not know and does not believe that the same [Gawron invention] was ever known or used before his invention thereof . . . ." (*Id.*, p. 32).

42. On June 15, 1965, the Patent Office received a requested amendment of the Matthews, et al., application which added claims 9 through 12. In the accompanying remarks it was noted that the claims were being entered into the record inasmuch as the applicant had been advised they had just been allowed in another pending application directed to the identical subject matter. The applicant understood the other application was that of Mr. Gawron (DX 9, pp. 19-23).

43. On June 30, 1965, attorneys for Skil and Lucerne met in Chicago. Lucerne exhibited its first two trigger speed control device prototypes (DX 16, 17). Counsel for Lucerne represented that the two prototypes were made by Mr. Matthews and others before the relevant Gawron invention dates, but no supporting documentation was shown by Lucerne at this meeting (T 2949-2954).

44. Approximately one week later, on July 7, 1965, Skil paid the final fee for the Gawron application to the Patent Office (PX 2, p. 36).

45. One week later, by letter dated July 13, 1965, counsel for Skil informed counsel for Lucerne that Skil had received official notice from the Patent Office of al-

lowance of the Gawron application. The letter noted that, "Since we have heard nothing from you concerning establishing the reduction to practice dates associated with the switch unit shown to us during your visit of June 30, 1965, we assume these dates cannot be supported by clear and convincing evidence as required." The letter continued that Skil paid the final fee to avoid any delay in issuance of the patent, since, "As you and your client will appreciate, a delay in granting of this patent could place both Skil and Lucerne at a disadvantage." The letter concluded that if Lucerne subsequently developed adequate proof concerning the Lucerne invention dates, ". . . appropriate steps can of course be taken so that the patent will be awarded to the proper party." (DX 22).

46. Lucerne did not object to Skil's payment of the fee. In a letter dated July 20, 1965, counsel for Lucerne confirmed receipt of the July 13 Skil letter, and noted in part that Mr. Matthews ". . . has not as yet completed his investigation of files in an effort to find proof of his invention relating to the speed control device which I disclosed to you during my visit of June 30 to the Skil headquarters." Counsel expected that Mr. Matthews would conclude his investigation within a very short time (DX 23).

47. On September 28, 1965, the Gawron patent (PX 1) issued out of the Gawron application (PX 2).

(a) The Gawron application does not mention the June 30, 1965, meeting between the parties.

48. From the very beginning of their contacts, Skil expressed an interest in acquiring Lucerne (T 2608). There was a meeting in the spring of 1966 between, among others, Mr. John W. Sullivan, then President of Skil, and Mr. Matthews. (T 3268-3268A). This meeting was followed by formal offers of purchase from Skil, dated March 30, 1966,

and April 6, 1966 (PX 165, 166). Although Mr. Sullivan was of the opinion that a purchase agreement was imminent (PXR 48), the acquisition was never consummated (T 3299). Mr. Sullivan did not threaten to litigate Lucerne to death if there was no agreed upon sale (T 3299-3300, 3327).

49. On November 15, 1965, Skil and Lucerne amended their earlier license agreement, by entering into an addendum which in part took note of the Gawron patent, and stated that if Lucerne obtained a patent it would be assigned to Skil with Lucerne receiving a nonexclusive, royalty-free license (PX 99).

50. On May 19, 1966, the patent examiner rejected all claims of the Lucerne application (DX 9, pp. 33-35).

51. On August 4, 1966, an amendment was filed to the Lucerne application. As to claims 9 through 12 Lucerne requested that an interference be declared between its application and the Gawron patent (*Id.*, pp. 36-44).

52. In response to the amendment of August 4, 1966, the patent examiner rejected all Lucerne claims on September 9, 1966 (*Id.*, pp. 95-97), and sometime thereafter the application was abandoned (*Id.*, p. 98).

53. After the Gawron patent was issued on September 28, 1965, during the period between early 1966 and August of 1967, Lucerne, for the first time, showed a document (DX 158) to Skil in an effort to establish priority of invention. Two additional documents (DX 156, 157) were first disclosed to Skil in August of 1967 (T 2948-2954).

54. There is no clear and convincing evidence that Skil intentionally withheld from, or misrepresented to, the Patent Office any pertinent or material information concerning the Gawron application.

55. There is no clear and convincing evidence that any of Skil's conduct before the Patent Office was taken with the intent to deceive.

56. Skil has had a national account with the J. C. Penney Company (J. C. Penney) for the sale of a varying range (from ten to forty) of Skil power tools since at least 1970 (T 1958-1959; DX 120A).

(a) The general procedure was for Skil to enter into a contract with J. C. Penney once or twice a year, each contract specifying a price for each separate Skil product being sold during the contract period. Skil's overall objective in each contract was to obtain a profit. Certain tools in the mix were sold at a loss, but these losses were compensated for by the profit made on other tools in the mix (T 2762-2765; DX 122, pp. 24-25).

57. During the period 1971 through 1977 Skil sold products, including drills, to J. C. Penney incorporating the Gawron invention. Some of these drills were sold below cost, while others were sold at a profit. During the same period Skil sold products, including drills, which did not incorporate the Gawron invention. Some of these drills were sold below cost, while others were sold at a profit. (T 2002-2004, 2060-2062, 2755-2758, 2760-2767; DX 120A, 142). An example from each of these categories shows the following during the August 3, 1971 contract (DX 120A):

(a) A drill containing the Gawron invention, designated as Part 457-49:4, was sold for a 30.8% profit.

(b) A drill containing the Gawron invention, designated as Part 501-49:3, was sold at a loss of 14.7%.

(c) A drill which did not incorporate the Gawron invention, designated as Part 541-49:5; was sold for a profit of 35.5%.

(d) A drill which did not incorporate the Gawron invention, designated as Part 503-49:8, was sold at a loss of $34.1%.

58. There is no evidence that Skil conditioned the sale to J. C. Penney of one product upon the sale of another product, or that Skil conditioned the sale of a product with the Gawron invention upon the sale of any other product. There is no evidence that those Skil products containing the Gawron invention which were sold below cost were sold in that manner because they contained the invention. There is no evidence that during any contract period the total loss from sales of products containing the Gawron invention exceeded the total profit made from other products containing the Gawron invention.

59. Wen, one of the defendants herein, manufactures a line of electric portable tools, including drills (DX 121, p. 7). Wen has sold power tools to J. C. Penney since the early 1960's (*Id.*, p. 11). Over a certain period of time J. C. Penney discontinued purchasing various items from Wen. While it appears that some of the Wen items were discontinued in favor of Skil items (*Id.*, pp. 49-52), there is no evidence that those particular items included the Gawron patent invention, or that those particular items were being sold by Skil below cost to J. C. Penney. Since 1972 Wen's business with J. C. Penney has expanded rather substantially, to the point where it has become a "very good" account (DX 122, p. 21).

Devices Covered by the Gawron Patent

60. Lucerne has manufactured essentially two different speed control devices: (1) the TSC 113 and 114 models; and (2) the TSC 252, 254, and 256 models. The first type was manufactured and sold between 1964 and 1968. The second type (hereafter referred to as the

TSC 254 model) was manufactured and sold from late 1968 to the present time (PX 44, at Interrogatory 35; PX 130, at Interrogatory 2; Stip., paras. 23, 25).

61. The first speed control device, in models TSC 113 and 114, comes under the terms of the Gawron patent (PX 40, pp. 37, 40; PX 44, at Interrogatory 35, 36; PX 101, 102). The remaining issue is whether the TSC 254 model comes under the Gawron patent.

62. The Gawron invention permits the operator of a tool which is being run on alternating electric current to vary and control the voltage and current being applied to the tool motor, and thus its speed, by using human feedback to manipulate the trigger of the tool. Manipulation of the trigger alone does not achieve speed control. Rather, the trigger and motor must be connected to an SCR speed control circuit. Such a circuit functions as follows (PX 20A, 20B; T 218-246):

(a) Absent an SCR speed control circuit the voltage appears at the motor in alternating waves of positive, then negative, polarity. A positive voltage wave begins at zero, increases to its peak voltage, then decreases back to zero. The voltage then reverses its polarity, from positive to negative, and the negative voltage wave then appears at the motor in form and manner essentially the mirror image of the positive wave. One cycle is defined as a positive wave followed by a negative wave. In the United States sixty of these cycles commonly occur each second. The electric current flows through the circuit in two directions, changing its direction with each change in voltage polarity, hence the term "alternating current." Although the voltage changes its polarity, and the current changes its direction, during each cycle, the motor does not recognize these changes and runs in a single direction at the maximum speed permitted by the voltage.

(b) Inserting an SCR in the alternating current circuit has the effect of blocking the flow of current in one of its two directions. As a result the motor receives current for one-half of each cycle, and coasts during the other half cycle. The half cycle of current which the motor receives is always flowing in the same direction. The other current direction is always blocked by the SCR.

(c) If only an SCR is placed in the circuit there will not be speed control. The motor will be run by current flowing to it at a constant rate equal to one-half of every cycle. It is necessary to add a timing circuit to the SCR, which enables the operator to alter the amount of voltage and current being applied to the motor, and thus alter the motor speed. The timing circuit is controlled by manipulating the tool trigger. By way of example, the operator may manipulate the trigger to set the timing circuit in such a way that voltage causes current flow to the motor during one-eighth of the cycle rather than the one-half cycle permitted by the SCR alone. By moving the trigger the operator may alter the timing circuit in such a manner to permit current flow to the motor during one-fourth of each cycle, thereby increasing the motor speed. The combination of an SCR with a timing circuit is the SCR speed control circuit.

63. The amount of current being applied to the motor at any given time is sometimes described in terms of bursts, or pulses, of voltage. The motor is energized, or caused to operate, by each pulse of voltage, then coasts between pulses. Because the pulses are being applied at a rapid rate the coasting is indistinguishable from the pulses. The SCR speed control circuit varies the duration of the pulses, hence the amount of voltage being applied to the motor, and thus the motor speed.

64. The timing circuit of the SCR speed control circuit in the Lucerne TSC 254 is in parallel relationship with the motor (DX 149; T 492-506, 1383-1386, 1560); whereas, the timing circuit of the SCR speed control circuit described in the Gawron patent is in series relationship with the motor (T 491-492, 1382-1383, 1559-1560). The parallel relationship found in the Lucerne circuit is not covered by the claim language of the Gawron patent, which is limited to a series relationship (PX 1).

65. Comparison between the SCR speed control circuits of the Gawron patent and the Lucerne device (PX 20) reveals the following:

(a) In a parallel relationship when the SCR is turned off, i.e., when it is blocking current to the motor, there is no line voltage into the motor; whereas in a series relationship voltage is applied to the motor even when the SCR is turned off. The result is that voltage transients (termed "hash") caused by the motor are sometimes generated in the Gawron circuit when the SCR is off, whereas, hash is not generated in the Lucerne circuit when the SCR is off (DX 171; T 2133-2161).

(1) The hash cannot be discerned by the operator of the drill, but it is sometimes discernable by means of an oscilloscope. There is no evidence that this hash has a demonstrable effect upon the circuit operation or its components (T 2162-2163, 2332-2343, 2394-2403).

(b) In both the parallel and series relationships when the SCR is turned on, i.e., when it is supplying current to the motor, the current flows to, and through, the motor in the same manner (PX 20; T 1382-1392).

(c) The voltage wave forms, as depicted on an oscilloscope, which are generated by the Gawron circuit are substantially identical to those generated by the Lucerne circuit (PX 160; DX 163; T 1547-1555).

(d) The SCR itself, as distinguished from the timing circuit of the SCR speed control circuit, is in a series circuit relationship with the motor in both the Gawron patent and Lucerne device (T 586, 1557, 1560-1561).

(e) The various components which comprise the SCR speed control circuit of the Gawron patent are essentially the same as the components in the Lucerne TSC 254 SCR speed control circuit (T 1560-1562).

(f) Whether the timing circuit is in series or parallel relationship with the motor, the results of the Gawron and Lucerne circuits are the same in that they both control motor speed (T 1562).

(g) It is the load voltage running to the motor which controls the motor speed. The most significant result of any SCR speed control circuit is how it controls this load voltage. In both the Gawron and Lucerne circuits load voltage is controlled in essentially the same fashion (T 1540, 1560, 1562-1563).

(h) Human feedback is utilized in the same manner in both speed control circuits.

66. The Lucerne TSC 254 speed control device is equivalent to a device covered by the express language of the Gawron patent since it does the same work in substantially the same way and accomplishes the same result.

Cancellation of the License Agreement

67. As noted earlier, Skil and Lucerne entered into a nonexclusive license agreement concerning the Gawron patent on March 9, 1965, and entered into an addendum thereto on November 15, 1965 (PX 98, 99).

(a) These two agreements, hereafter referred to collectively as the license agreement, did not provide a dura-

tion of time during which the contract would remain in effect.

(b) The license agreement did not set forth any conditions under which it could be cancelled, with the exception of granting the licensee a right to cancel if the licensor failed to bring suit to stop infringement of its patent by unlicensed third parties (PX 98, para. 3).

68. The license agreement (*Id.*) obligated Skil to institute litigation against infringers of the Gawron patent, which Skil did initiate, beginning in 1965. With the exception of one case the litigation was settled and resulted in several licensing agreements during the 1965 to 1967 period (T 703; PX 114, 115, 117 and 122).

69. Under the license agreement Lucerne was obligated to account and pay royalties to Skil for units manufactured in each calendar quarter within thirty days thereafter (PX 99); however Lucerne failed to commence paying royalties.

(a) On May 17, 1967, Mr. Matthews informed Skil that Lucerne would continue working under the license agreement, and that Lucerne's accounting department was completing its audit to determine the royalty payments due, at which time Lucerne would arrange for a transmittal of same (PX 100).

(b) On August 25, 1967, Mr. Matthews sent a check in the amount of $1,000, with a letter which indicated it covered ". . . partial payment of the amount we owe you in royalties under the Gawron patent. . . ." In the same letter Mr. Matthews noted that Lucerne's auditor had just returned from a long trip to Europe which, with other matters, left items undone. The auditor was ". . . now catching up and a complete report will be forwarded to you in the near future." (PX 101).

(c) Mr. Matthews sent another letter on November 2, 1967, which noted that the auditor has ". . . finally arrived at the number of TSC switches sold to firms other than Skil." The number of switches sold was 356,552, resulting in royalties due of $24,000, deducting the $1,000 already paid. Mr. Matthews concluded, "Now that we know the amount, we can arrange for method of payment." (PX 102).

(d) The royalties remained unpaid, except for the single payment of $1,000. Lucerne's attorney wrote Skil's attorney on May 2, 1968, suggesting a method of payment involving a 5% rebate arrangement. The attorney also noted that he understood an "up-to-date accounting" was being completed and would be shortly available (PX 103).

(e) No royalties, except for the $1,000, have been paid.

70. As noted earlier, during the period between 1964 to late 1968 Lucerne manufactured one type of trigger speed control device. Since late 1968 to date Lucerne manufactured a new type of speed control device, the TSC 254 (*see* Finding of Fact 60).

(a) In February of 1968 Lucerne's counsel informed Skil's counsel by letter that Lucerne did not consider its new TSC 254 speed control (which had its timing circuit in parallel relationship with the motor) to infringe the Gawron patent, thus Lucerne claimed it was not obligated to pay royalties thereon under the 1965 license agreement. (DX 83). This claim was made in good faith, and presented an honest argument in view of the patent language which limited the timing circuit to a series relationship with the motor.

71. Following the continuing failure of Lucerne to pay royalties on its speed control switches Skil instituted

an action in the United States District Court for the Northern District of Illinois in July of 1968 seeking, among other relief, an accounting for royalties due under the Skil-Lucerne license agreement, and a ruling that the new Lucerne TSC 254 model switch was covered by the Gawron license. This action was subsequently transferred to this court and is the C69-461 lawsuit currently being tried.

72. In this action, on June 13, 1969, Judge Will of the Northern District of Illinois granted partial summary judgment to Skil on Count I, ordering Lucerne to account for all switch devices sold ". . . under the Gawron license. . . ." (the license agreement of PX 98 and 99). Judge Will did not order summary judgment as to Count II, which sought a ruling that the Lucerne TSC 254 switch was within the scope of the Gawron license (PX 126).

(a) Following the decision of *Lear, Inc. v. Adkins*, 395 U.S. 653 (1969), in an order filed September 24, 1970, Judge Will vacated the summary judgment and permitted Lucerne to assert the defense of patent invalidity (PX 127, pp. 1, 10).

(b) Despite alleging patent invalidity Lucerne has maintained to this day that the 1965 Skil-Lucerne license agreement was not cancelled, rather it has remained in full force and effect (*see, e.g.*, Amended First Counterclaim of Lucerne, paras. 28, 31).

73. The various licensing agreements entered into by other companies and Skil between 1965 and 1967 (as a result of the Skil lawsuits) called for no royalty payments to Skil in the event the licensees were purchasing speed control devices from a licensed source. In 1970 Lucerne continued to fail to pay royalties. Skil heard that Lucerne was holding itself out as a licensed source, which was causing Skil problems with some of its other licensees. Skil felt it was placed in such an untenable position that

it decided to cancel the Skil-Lucerne license agreement (T 708-710, 713, 1860-1861, 1873-1874, 1905-1907, 1917-1919). As a result Skil informed Lucerne by letter, received on November 16, 1970, that Skil was cancelling the agreement. The reason given for cancellation was that although Lucerne owed royalties it had ". . . willfully refused to pay any payments to Skil under the license, other than the $1,000 payment, and have therefore breached the license agreement. Accordingly, Skil now elects to cancel the license and henceforth to treat your company as an infringer of the Gawron patent." (PX 109; Stip. para. 20).

(a) The Skil cancellation letter did not mention any other reason for cancelling. There was no clause in the license agreement permitting cancellation for nonpayment of royalties (PX 98, 99).

(b) There is no evidence that by holding itself out as a licensed source Lucerne acted in any manner contrary to the allegations in Skil's 1968 lawsuit that the parties had a license agreement, that royalties were due on it, and that Lucerne claimed the TSC 254 was not covered by the license. Specifically, there is no credible evidence that Lucerne represented to others that its TSC 254 was covered by the license.

(c) At the time it declared the license agreement with Lucerne cancelled, letters were sent to a number of licensees informing them of the cancellation and of Skil's intention to continue its litigation against Lucerne for past royalties due on speed control devices, including the Model TSC 254 (DX 160a-160g). A similar letter was written to another licensee in October of 1971 (DX 159).

74. After cancelling the license agreement in November of 1970 Skil filed its suit for infringement of the

Gawron patent on November 13, 1972, in the Northern District of Illinois. That case has since been transferred and is Case C74-121 in the Northern District of Ohio, which case was consolidated and is being tried with C69-2854, in the Northern District of Illinois.)

461. (*See* original complaint in C74-121, Civil Action 72C 2854, in the Northern District of Illinois.)

Defendants' Sales Activities

75. The license agreement gave Lucerne a nonexclusive license ". . . to make, have made, use or sell motor speed control switch units. . . ." covered by the Gawron patent (PX 98).

76. Mr. Matthews signed the Skil-Lucerne license agreement as the president of Lucerne (PX 98, 99), a position he had held since 1946 (T 2480-2481). He has also been the sole shareholder of Lucerne since 1970, and before then he and another owned all the stock (T 2857-2858).

77. In the infringement action those defendants other than Lucerne and Mr. Matthews were indemnified by Lucerne since they purchased their accused devices from Lucerne (PX 76, 78). The damages sought by Skil from these other defendants relate to the Lucerne speed control devices (PX 146, 148, 149, 155).

78. Relevant sales of Lucerne devices which came within the Gawron patent totaled three million five hundred ninety thousand seven hundred fifty-seven dollars ($3,590,757.00) as of November 16, 1970. Subsequent to that date there was an additional three million three hundred eighty-three thousand one hundred eighty-four dollars ($3,383,184.00) in relevant sales of Lucerne switches (PX 155; Stip. para. 43A).

(a) Thus total relevant sales of Lucerne switches since September 28, 1965 was six million nine hundred seventy-three thousand nine hundred forty-one dollars ($6,973,941.00). The three percent royalty called for in the license agreement totals two hundred nine thousand two hundred sixteen dollars ($209,216.00). Adding simple six percent interest to the royalties from the date each royalty payment was due gives a total of two hundred ninety-two thousand four hundred ninety dollars ($292,490.00) in royalties and interest (PX 155).

THE FRENZEL PATENT

Nonobviousness

79. The claims of the Frenzel patent at issue are claims 5, 7, 9 and 10. Each claim relates to a means for reversing the direction of rotation of the motor in an electrically powered portable tool which is operated by a trigger. As applied to a hand held electric drill, the result is to change the rotation of the drill from clockwise to counterclockwise, or vice versa. The reversing mechanism includes an operating lever which has two positions. Movement of the lever from one position to the other causes the direction of rotation to be reversed. The patent specification notes that the "primary object" of Frenzel is to provide a reversing mechanism which includes an operating lever with ". . . a portion thereof uniquely arranged in relation to the tool trigger so that a person's finger operating the trigger may at the same time engage the operating lever for ready operation thereof." (PX 24). Implicit in this language, as well as from expert testimony (T 1026-1028, 1059-1060), is that this relationship between the tool trigger and the operating lever is applicable to when the operator is gripping the drill handle and operating the drill in normal fashion.

As so applied, the "at the same time" relationship between trigger, operating lever, and trigger finger is reflected by the following language in claims 5, 7, 9 and 10 (PX 24):

(a) Claim 5 refers to a "reversing member" which ". . . has a finger engageable, exterior portion disposed adjacent said trigger so that a person's finger may simultaneously engage said trigger and said exterior portion of said member thereby to move the latter between said two positions, ..."

(b) Claim 7 refers to a "reversing member" with a portion thereof ". . . being closely adjacent said trigger so that a person's trigger finger may simultaneously engage said trigger and said reversing member portion. . . ."

(c) Claim 9 refers to a "reversing arm" which ". . . has one end thereof disposed closely adjacent said trigger for engagement by an operator's trigger finger, ..."

(d) Claim 10 refers to a "reversing member", with a portion thereof ". . . being closely adjacent said trigger so that a person's trigger finger may simultaneously engage said trigger and said reversing member portion, ..."

80. As of July 12, 1965, the date the Frenzel application was filed, the scope and content of the prior art included the following:

(a) The Skil Model 823 electric impact wrench (DX 27; Stip. para. 49), which has a reversing mechanism operated by means of a knob-like device mounted on the tool handle below the trigger. It measures approximately 1/2" wide and 1 1/4" long.

(b) Patents 2,425,923 (DX 42), 2,575,523 (DX 43), 2,580,631 (DX 44), 2,693,867 (DX 45), 2,802,556 (DX 46), and 2,903,111 (DX 47), each of which relates to an impact

tool, similar to the air impact wrenches sold by Skil in 1963 (DX 28, pp. 44-45). Each patent shows at least one figure which depicts a reversing lever, or similar mechanism, located fairly close to the trigger of the tool; however, none of the patents describe the arrangement between the reversing lever and the trigger, rather each relates to improvements in the impact clutch mechanism (DX 42, 43, 45, 47), or improvements in the impact driving connection (DX 44, 46).

(c) Thomas patent 3,194,898 (Thomas), which relates to selector switches of the trigger actuated type (PX 25A). One object of this invention is to provide a reversible trigger switch which is especially adapted on a portable tool handle. The reversing mechanism of Thomas is operated by means of turning the front end of the tool trigger.

(d) Obszarny patent 2,390,846 (Obszarny), which refers to a handgrip control switch on the control stick of an airplane (PX 25A). The switch lever is located on the handle. If applied to the handle of a portable tool the reversing lever would be located above the trigger, but on the opposite side of the handle.

(e) Kaman patent 2,744,176 (Kaman), which refers to a switch actuating mechanism for electric tools (PX 25A). The reversing mechanism is operated by means of pushing a device located in the tool handle near the top of, and behind, the trigger. The device protrudes from each side of the handle perpendicular to the plane of the trigger.

81. The difference between the prior art and claims 5, 7, 9 and 10 of the Frenzel patent is as follows:

(a) The Skil Model 823 impact wrench (DX 27) contains all the elements of claim 10 of Frenzel, except for the clause in that claim which reads (PX 24; T 1016-

1019), "said reversing member portion being closely adjacent said trigger so that a person's trigger finger may simultaneously engage said trigger and said reversing member portion. . . ." The reversing member of the Skil impact wrench is located below the trigger, and both are located on the tool handle. The trigger finger can simultaneously touch the trigger and reversing member of the impact wrench only by using an unnatural or contorted grip which does not permit normal operation of the trigger or wrench. Under normal operation of the impact wrench the trigger finger cannot simultaneously engage both the trigger and reversing member; whereas normal operation of a tool containing the Frenzel reversing member permits said simultaneous engagement (T 1026-1028, 1059-1060).

(b) Each impact tool patent (DX 42-47) includes a figure which depicts the trigger of a portable impact tool located on the handle slightly below a reversing lever. No physical devices which embody these patents were introduced into evidence, nor was there any testimony concerning same. There is no language in any of these patents which states that the trigger finger operating the trigger may simultaneously, or at the same time, engage a reversing lever. Although defendants argue the two dimensional figures of these prior art patents show such a relationship, the lack of any additional evidence renders the figures insufficient to reach such a conclusion. The difference between these prior art patents and Frenzel is that Frenzel defines a relationship, under normal operating conditions, between the trigger, trigger finger and reversing lever which the impact tool patents fail to disclose.

(c) Although the reversing member of Thomas comprises the end of the tool trigger, the reversing member cannot be operated by the trigger finger alone (PX 25,

pp. 32-33; PX 25A, at Thomas patent, column 1, lines 59-61).

(d) Under Obszarny the operator cannot use his trigger finger to operate, or engage, the reversing member while at the same time he operates the trigger (PX 25, p. 32).

(e) The Kaman reversing member is operated in one direction by using the thumb, rather than by using the trigger finger. Moreover, during operation of a Kaman drill the operator cannot simultaneously operate, or engage, the reversing member with his trigger finger (PX 25, pp. 31-33; PXR 49; T 3470-3472, 3487).

82. The level of ordinary skill in the art as of July 12, 1965, was as follows:

(a) The only expert witness to testify concerning the Frenzel patent was Mr. Gawron, and his testimony was primarily directed toward whether the accused device was covered by the Frenzel patent, although he did testify that the Skil 823 Model impact wrench had all the elements of Frenzel's claim 10, except for the element showing a particular relationship between trigger, trigger finger and reversing member. Essentially, the level of ordinary skill in the art was that reflected by the prior art and Mr. Gawron's testimony.

(b) Defendants have failed to produce any expert testimony showing the level of ordinary skill in the art, or showing that the Frenzel patent was obvious to a mechanic of ordinary skill in the art.

83. As noted earlier, Skil sued Lucerne in 1968 on the license agreements concerning the Gawron and Frenzel patents. By order filed June 13, 1979, the United States District Court for the Northern District of Illinois, where this action was originally filed, granted summary judg-

ment on Count III of the complaint, which sought royalties from Lucerne for the sale of switches covered by the Frenzel patent (PX 126). Lucerne subsequently moved to vacate this judgment, but the motion was denied by order filed September 24, 1970 (PX 127). In denying the motion to vacate the court noted that at no time in the proceedings up to that point had Lucerne even remotely raised the issue of validity of the Frenzel patent (*Id.*, pp. 14-15).

84. The action filed in the Northern District of Illinois was subsequently transferred to this court. By order dated May 10, 1972, Lucerne was permitted to file its third amended answer and counterclaim (DX 143). The third amended answer raised the issue of validity of the Frenzel patent. Thereafter Skil filed a motion seeking summary adjudication on the issue of Lucerne's right to raise the issue of validity. On August 20, 1977, the motion was denied (PX 128). The court noted that Skil had filed a supplemental complaint asserting a fourth count in this action involving the Frenzel patent, and that in the interest of justice it had granted Lucerne leave to file second and third amended answers. In denying the motion the court stated in part that (*Id.*, p. 6):

> To the extent defendant Lucerne does not raise the issue of validity of the Frenzel patent as to Count III of the complaint in C69-461, the court finds Lucerne's assertion of certain defenses and claims in its second and third amended answers is not manifestly inconsistent with the prior September 24, 1970 ruling of Judge Will.

85. When Judge Will entered summary judgment on Count III, and later refused Lucerne's motion to vacate, Mr. Matthews was not a defendant in this action. He was made a party defendant approximately seven years

later, in 1977, and he has separately raised the issue of validity of the Frenzel patent.

Conduct of Skil

86. Application for what eventually became the Frenzel patent was filed in the United States Patent Office on July 12, 1965 (PX 25, cover page). On November 8, 1965, Skil's attorney submitted a Request for Special Status (*Id.*, pp. 29-36), and in connection therewith made a pre-examination search, which identified the relevant prior patents as Thomas, Obszarny, and Kaman (*Id.*, p. 30). These patents were called to the attention of the Patent Office accompanied by arguments to distinguish them from the Frenzel application (*Id.*, pp. 30 ff.). Following a number of supplemental amendments the Patent Office mailed formal notice of allowance on March 14, 1966 (*Id.*, p. 50), and the Frenzel patent was granted on July 12, 1966 (PX 24).

87. Included among the prior art which was not cited or referred to by Skil in its patent application was the Skil Model 823 electric impact wrench (DX 27; Stip. para. 49).

(a) This Skil tool contained all the elements of claim ten of the Frenzel patent with the exception (T 1016-1019) of the clause which reads (PX 24):

> . . . said reversing member portion being closely adjacent said trigger so that a person's trigger finger may simultaneously engage said trigger and said reversing member portion, ...

(b) The Skil wrench was no more relevant or material prior art than the Kaman patent which Skil had disclosed to the Patent Office (T 3470-3472, 3487). The Frenzel patent would have issued even if the Skil impact wrench had been cited as prior art.

(c) There is no evidence that Skil intentionally withheld the Skil Model 823 impact wrench from the Patent Office.

88. Skil's national account with J. C. Penney (see Findings of Fact 56 and 57) included the sale of products, including drills, which incorporated the Frenzel invention. Some of these drills were sold below cost, while others were sold at a profit. During the same period Skil sold other products, including drills, which did not incorporate the Frenzel invention. These drills were sold below cost, while others were sold at a profit. An example of each of these categories shows the following during the April 5, 1973, or September 1, 1974, contracts (DX 120A, 142):

(a) A drill containing the Frenzel invention, designated as part 457-5:49, was sold for a 2.1% profit (September 1, 1974).

(b) A drill containing the Frenzel invention, designated as part 597-6:49, was sold at a loss of 1.9% (September 1, 1974).

(c) A drill which did not incorporate the Gawron invention, designated as part 541-5:49 was sold for a profit of 10.4% (April 5, 1973).

(d) A drill which did not incorporate the Frenzel invention, designated as part 503-10:49, was sold at a loss of 16.2% (September 1, 1974).

89. There is no evidence to show that Skil conditioned the sale to J. C. Penney of one product upon the sale of another product, or that Skil conditioned the sale of a product with the Frenzel patent device upon the sale of any other product. There is no evidence that those Skil products containing the Frenzel invention which were sold below cost were sold in that manner because they

contained the invention. There is no evidence to show that during any contract period the total loss from sales of products containing the Frenzel invention exceeded the total profit made from sales of other products containing the Frenzel invention.

Devices Covered by the Frenzel Patent

90. On April 11, 1967, Skil and Lucerne entered into a nonexclusive license agreement concerning the Frenzel patent (T 667-670; PX 104). This license agreement has remained in force and effect since that date.

91. Lucerne has manufactured three types of reversing switches: (1) Model A, which includes a forwardly extending reversing lever; (2) Model B, which has its reversing lever protruding from the side of the tool handle, approximately perpendicular to the plane of the trigger; and (3) Model C, which has its reversing lever extending in a rearward direction.

(a) Lucerne concedes that its Model A switch is within the scope of the Frenzel license, which is confirmed by comparing this switch to the Frenzel patent (PX 29; 29A; 44, at Interrog. Answers 40-42; 77, p. 122).

(b) Skil does not contend that the Frenzel patent covers the Model C switch.

(c) The remaining issue is whether the Model B switch is covered by the Frenzel patent. This switch is manufactured and sold by Lucerne as TSCRA 252, 254 or 256 switches, TSCR 252, 254, or 256 switches, and TRMR switches (PX 30, 31, 33A; Stip. paras., 37, 38, 42).

92. Mounting the Lucerne Model B reversing switch in a portable drill (PX 13, 32) results in the following. The operating, or reversing, lever of the switch protrudes through a slot cut into the handle of the drill, located

a short distance behind the trigger, on an imaginary line extending backward from the top of the trigger. The reversing lever protrudes out of the left side of the handle. In one of its two positions the lever is perpendicular to the plane of the trigger. When pushed into the second position, thereby reversing the rotation, the lever is pushed toward the trigger. The location of the Model B reversing lever relative to the trigger is approximately that of the left end of the reversing button described in the Kaman patent (T 576; PXR 49).

93. The location of the reversing lever of the Lucerne Model B switch in a drill results in the following relationships:

(a) When holding the drill handle in the right hand the Model B reversing lever would be normally operated by the right thumb, without changing the operator's grip on the handle (PX 13, 32; T 562). By comparison, operation of the reversing lever with the trigger finger of the right hand would require a slight change, or shift, of the handgrip on the drill handle (T 1002-1003, 1020).

(b) When holding the drill handle in the left hand the Lucerne Model B reversing lever is in a different relationship with the trigger and the operator's hand. The operator cannot operate the reversing lever with his left thumb unless he changes his grip on the handle. To operate the reversing lever with the left-hand trigger finger the operator must slightly shift, or change, his grip (T 564-565; PX 13, 32), and a different portion of the left-hand trigger finger is used than is used by the right-hand trigger finger.

(c) The difference in relationship between the hand, trigger, and Lucerne Model B reversing lever, depending upon whether the drill is being operated by the right

or left hand, is in contrast to a physical embodiment of the Frenzel reversing lever and switch as portrayed in the figures of the patent. With such a Frenzel embodiment there is no difference in relationship, whether using the left or right hand. Moreover, this physical embodiment renders it unnecessary to shift or change the handgrip in operating the reversing lever (PX 24, 27; T 303-306).

94. The file wrapper history of Frenzel reflects that in seeking to distinguish Kaman from Frenzel it was noted in part that the simultaneous relationship called for by Frenzel permitted the operator to change direction of rotation "in a rapid manner"; whereas, with Kaman the reversing member could not be manipulated by the trigger finger alone, and the operator "must change his grip . . . before actuating the reversing mechanism" (PX 25, p. 33). In seeking to distinguish Thomas it was argued in part that the reversing member could not be "readily rotated" by the trigger finger alone, rather it "requires the operator to change his grip" on the tool and rotate the reversing mechanism with two fingers (*Id.*, p. 32). In seeking to distinguish Obszarny it was argued in part that the reversing member thereof could not be "manipulated by the trigger finger alone without the operator practically releasing the handgrip." (*Ibid.*) In addition to this file wrapper history, at trial Mr. Gawron distinguished the Skil Model 823 impact wrench in part by noting that simultaneously touching the trigger and reversing member thereof could only be accomplished by means of an unnatural or contorted grip (T 1026-1028, 1950-1060 [sic]).

(a) changing the normal grip on the drill handle negatives the Frenzel element of "operating" the trigger at the same time as engaging the reversing lever. Once the grip is changed there can no longer be the normal trigger operation which is implicitly called for by Frenzel (PX 24; T 1059-1060).

95. To hold that the Lucerne Model B reversing switch is covered by the Frenzel patent would be to ignore the fact that when holding and normally operating a drill with the right hand the operator will reverse rotation by using his right thumb to manipulate the reversing lever rather than by using his right trigger finger. Indeed, using the right thumb permits operation of the trigger simultaneously with engaging or operating the reversing lever; whereas using the right trigger finger fails to meet this simultaneity requirement since a shift in the handgrip is required.

96. The Lucerne Model B reversing switch is not covered by the Frenzel patent, nor is the switch equivalent to the Frenzel patent.

Defendants' Sales Activities

97. Only Lucerne and Mr. Matthews have been sued on the Frenzel license agreement. Sales of Model A devices incorporating the Frenzel patent total one hundred forty-two thousand two hundred fifty-three dollars ($142,253.00), with the royalty called for in the license agreement totaling fourteen hundred twenty-four dollars ($1424.00). Adding simple six percent interest to the royalties due gives a total of fifteen hundred eighty-nine dollars ($1589.00) in royalties and interest (PX 142-154).

DISCUSSION AND CONCLUSIONS OF LAW

Jurisdiction and Venue

This court has jurisdiction over the subject matter of the C69-461 action, 28 U.S.C. § 1332, and it has proper venue as to all defendants. 28 U.S.C. §§ 1391, 1404(a); see Stip. paras. 7, 9. This court has jurisdiction over the subject matter of the C74-121 action, 28 U.S.C. § 1338,

and it has proper venue as to all defendants. *Skil Corp. v. Millers Falls Co.*, 541 F.2d 554 (6th Cir. 1976), *cert. denied*, 429 U.S. 1029; 28 U.S.C. §§ 1400(b), 1404 (a); see Stip., paras. 8, 10, 11.

THE GAWRON PATENT

Validity

There are three essential elements of patent validity: novelty, utility and nonobviousness, which are codified in 35 U.S.C §§ 101-103. The third element, nonobviousness, is actually the statutory equivalent of the judicial test of invention. *Reynolds Metals Co. v. Acorn Building Components, Inc.*, 548 F.2d 155 (6th Cir. 1977).

Since the Gawron patent was issued by the Patent Office it carries the statutory presumption of validity, which places the burden of proof on the party who asserts invalidity. *Id.; Bolkcom v. Carborundum Co.*, 523 F.2d 492 (6th Cir. 1975), *cert. denied*, 425 U.S. 951; *Sperberg v. Goodyear Tire & Rubber Co.*, 519 F.2d 708 (6th Cir. 1975), *cert. denied*, 423 U.S. 987. Defendants contend the Gawron patent is obvious. In this case the burden is upon the defendants to prove obviousness by a preponderance of the evidence. *Dickstein v. Seventy Corporation*, 522 F.2d 1294 (6th Cir. 1975), *cert. denied*, 423 U.S. 1055.

The fact the Seventh Circuit has already held the Gawron patent to be valid, *Skil Corporation v. Cutler-Hammer, Inc., supra*, greatly enhances the statutory presumption of validity. *American Home Products Corp. v. Lockwood Mfg. Co.*, 483 F.2d 1120 (6th Cir. 1973), *cert. denied*, 414 U.S. 1158. A prior adjudication of validity should be followed "unless the court is convinced of 'a very palpable error in law or effect.'" *Cold Metal Process Company v. Republic Steel Corp.*, 233 F.2d 828, 837 (6th Cir. 1956), *cert. denied*, 352 U.S. 891.

The ultimate determination of validity and obviousness is one of law, *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273 (1976); *Reynolds Metals, supra*, but the initial inquiry into obviousness entails several basic factual examinations, *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966):

> Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill and the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.

A secondary consideration such as commercial success may have relevancy to the issue of obviousness, *Id.*, at pp. 17-18, although commercial success alone will not render a patent valid. *Reynolds Metals, supra*; *Goodrich-Gulf Chemicals, Inc. v. Phillips Petroleum Co.*, 376 F.2d 1015 (6th Cir. 1967). Skil's receipt of over a million dollars in royalties under the Gawron patent and the fact it is the subject of many royalty-bearing licensing agreements provides some evidence of commercial success. *See Cold Metal, supra.*

The Gawron patent is a combination patent. Accordingly, the issue is whether the combination of old elements produces a new or different function. *Reynolds Metals, supra.* The test of obviousness for a combination patent is defined as follows, *Kearney & Trecker Corp. v. Cincinnati Milacron Inc.*, 562 F.2d 365, 370 (6th Cir. 1977):

> The synergistic test is met when a combination of elements produces an effect which is 'greater than the sum of the several effects taken separately.' . . . There must be an 'impalpable something' in the combination itself which consists of previously known elements to pass the requirement of nonobviousness. . . .

> Stated another way, there must be some 'unusual or surprising result' from a combination of old elements....

The key to the obviousness issue is whether it was obvious in September of 1962 to a mechanic of ordinary skill in the pertinent art to combine human feedback with a trigger and with an SCR speed control circuit to achieve speed control of an electric drill or other relevant device. The pertinent art was the use of an SCR in speed control circuitry, which was a relatively new art.

Prior to Gawron the use of SCR speed control circuitry to control the motor of a hand drill was reflected in the Australia patent, which used a knob to preset the desired speed, then maintained that speed by an inherent, or automatic SCR feedback circuit. This conformed to Gutzwiller, who stated that to achieve constant speed under varying load conditions it was necessary to use an SCR circuit which had inherent, or automatic, feedback. He taught that the use of human feedback would not succeed.

The Gawron patent specifically refuted the teaching of Gutzwiller. Gawron stated that human feedback would maintain constant motor or drill speed under varying load conditions, which was an unusual or surprising result. In light of Gutzwiller Gawron's use of human feedback was not obvious to a mechanic of ordinary skill in the art, thus the Gawron invention was nonobvious.

Rejection in Canada of an application for a patent virtually identical to the claims of the Gawron patent has been considered. *See American Infra-Red Radiant Co. v. Lambert Industries, Inc.*, 360 F.2d 977 (8th Cir. 1966), *cert. denied*, 385 U.S. 920. In view of the fact this court is unable to find substantial identity between the Canadian and United States patent laws, and is further unable to

find that there were substantially identical facts and circumstances surrounding the United States and Canadian applications, *see Timely Products Corporation v. Arron*, 523 F.2d 288 (2nd Cir. 1975); *Evans v. Watson*, 142 F.Supp. 225 (D.C. 1956), the impact of the Canadian rejection is insufficient to overcome the contrary evidence of non-obviousness.

Priority of Invention

Defendants contend that Skil is not entitled to the Gawron patent by reason of 35 U.S.C. § 102(g) which states:

> A person shall be entitled to a patent unless—
>
> . . . .
>
> (g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

A strict standard of proof is required to show priority of invention. The burden is on the defendants to show by clear and convincing evidence that not only was there a reduction to practice of the Lucerne speed control device, but also that it took place prior to the invention date of Gawron. *Dickstein, supra*; *Campbell v. Spectrum Automation Company*, 513 F.2d 932 (6th Cir. 1975).

An invention is reduced to practice under § 102(g) by building a working model and operating it under simulated field conditions, without the necessity of showing

successful commercial use. However, it does demand tests which successfully prove practical utility for its intended use. *Ajem Laboratories, Inc. v. C.M. Ladd Co.*, 424 F.2d 1124 (6th Cir. 1970), *cert. denied*, 400 U.S. 830; *Toledo Scale Corp. v. Westinghouse Electric Corp.*, 351 F.2d 173 (6th Cir. 1965). *Ajem* adopted the standard for a satisfactory reduction to practice outlined by the Court of Customs and Patent Appeals in *Field v. Knowles*, 183 F.2d 593, 601 (C.C.P.A. 1950):

> To constitute an actual reduction to practice of a machine, the device must be completed in an operative form capable of successfully demonstrating its practical utility in its intended field of use . . . . Unless the device is of such a nature that by its very simplicity its practical operativeness is manifest, . . . the machine must be tested under actual working conditions . . . in such a way as to demonstrate its practical utility for its intended purpose . . . beyond probability of failure . . . . Actual performance is required of the function for which the machine is intended with a quality, extent, and character of operation sufficient to indicate its utility in the environment in which it is contemplated to be useful. . . .

Defendants rely substantially upon oral testimony of the two inventors of the Lucerne device.[1] Their testimony, and the other evidence of defendants, is not of sufficient credibility to clearly and convincingly show that the Lucerne speed control device was reduced to practice prior

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1. The failure of defendants to call as witnesses three individuals whose testimony may have been relevant does not permit the negative inference that their testimony would have been unfavorable to the defendants. There has been no showing that as of the trial date these witnesses were peculiarly within the control or power of the defendants to produce them, thus the requirements for drawing a negative inference have not been shown. *United States v. Blakemore*, 489 F.2d 193 (6th Cir. 1973).

to September 28, 1962, the filing date of the Gawron application. The cryptically described testing which allegedly occurred prior to September of 1962 did not constitute a reduction to practice. Among other problems, the Lucerne testing failed to show that the prototype drill could operate under actual working conditions, such as drilling into wood or other material. The testing further failed to show that constant speed could be maintained when a varying load was applied to the prototype drill.

Assuming there was a reduction to practice in December of 1960, the failure of Lucerne to disclose its speed control device for thirty-six months thereafter, in late 1963 or early 1964, constituted suppression or concealment. During this period of time Lucerne primarily sought to obtain a retrofit feature, a feature which was not an element of either the Gawron patent or Lucerne's own patent application of March, 1964. *See Horwath v. Lee*, 564 F.2d 948 (C.C.P.A. 1977); *Young v. Dworkin*, 489 F.2d 1277 (C.C.P.A. 1974); *International Glass Company v. United States*, 408 F.2d 395 (Ct. Cl. 1969).

Defendants have failed to show that the activities of Mr. Rhine and Mr. Matthews in developing the Lucerne speed control device constituted prior invention pursuant to § 102(g).

Fraud On the Patent Office

Defendants contend that the Gawron patent is invalid since it was obtained by means of fraud on the Patent Office, and further contend it is unenforceable by reason of the closely associated defense of inequitable conduct before the Patent Office.

Not having testing facilities of its own, the Patent Office must rely upon information furnished by applicants and their attorneys. Mr. Gawron, like all other applicants,

stood before the Patent Office in a confidential relationship and owed the obligation of frank and truthful disclosure. *Charles Pfizer & Co. v. F.T.C.*, 401 F.2d 574 (6th Cir. 1968) *cert. denied*, 394 U.S. 920.

In *Kingsland v. Dorsey*, 338 U.S. 318, 319 (1949), the Supreme Court quoted with approval the following:

> By reason of the nature of an application for patent, the relationship of attorneys to the Patent Office requires the highest degree of candor and good faith. In its relation to applicants, the Office . . . must rely upon their integrity and deal with them in a spirit of trust and confidence. . . .

In *Precision Co. v. Automotive Co.*, 324 U.S. 806, 818 (1945) the Supreme Court said:

> Those who have applications pending with the Patent Office or who are parties to Patent Office proceedings have an uncompromising duty to report to it all facts concerning possible fraud or inequitableness underlying the applications in issue. . . . Public interest demands that all facts relevant to such matters be submitted formally or informally to the Patent Office, which can then pass upon the sufficiency of the evidence. Only in this way can that agency act to safeguard the public in the first instance against fraudulent patent monopolies.

Since the decision of *Walker Process Equipment, Inc. v. Food Machinery & Chemical Corp.*, 382 U.S. 172 (1965), fraud defenses (which will hereafter include the inequitable conduct defense) in patent suits have been asserted with increasing frequency. Those decisions in which the defense has prevailed are not easily reconciled nor subject to simple classification. *See In Re Multidistrict Litigation Involving Frost Patent*, 398 F.Supp. 1353 (D.Del. 1975),

modified, 540 F.2d 601 (3rd Cir. 1976). An example of disagreement is manifested by *Monsanto Company v. Dawson Chemical Company*, 312 F.Supp. 452 (S.D.Tex. 1970), *cert. denied*, 405 U.S. 974, and *Monsanto Company v. Rohm and Haas Company*, 312 F.Supp. 778 (E.D.Pa. 1970), *cert. denied*, 407 U.S. 934, *reh. denied*, 409 U.S. 899, which reached opposite conclusions as to whether fraud on the Patent Office occurred with reference to the same patent.

There does appear general agreement that a fraud defense requires the showing of at least two elements: (1) willful, wrongful conduct or intent before the Patent Office; and (2) the wrongful conduct or intent must have been in relation to a "material" matter before the Patent Office. However, courts remain in disagreement concerning the appropriate standards for these two elements. *Frost, supra.*

Concerning the element of intent, the Sixth Circuit requires that "mere technical" fraud is not sufficient. Rather, scienter or fraudulent intent is considered to be an integral part of the fraud defense. *Kearney, supra; Kolene Corporation v. Motor City Metal Treating, Inc.*, 440 F.2d 77 (6th Cir. 1971), *cert. denied*, 404 U.S. 886. Defendants rely heavily upon *Beckman Instruments, Inc. v. Chemtronics, Inc.*, 428 F.2d 555 (5th Cir. 1970), *cert. denied*, 400 U.S. 956. The Sixth Circuit utilized *Beckman* indirectly to define the intent element when it was distinguished in *Schnadig Corporation v. Gaines Manufacturing Co., Inc.*, 494 F.2d 383, 393 (6th Cir. 1974): "In *Beckman* the patentee deliberately and knowingly concealed a reference that was known to be anticipatory and intentionally made misrepresentations to the Patent Office. In short there was an intent to deceive." *Schnadig* further defined the intent element by noting that, "In *Monsanto*, although the court did not require a specific intent to deceive, the pat-

entee had intentionally made misrepresentations by presenting half-truths to the Patent Office and deliberately made representations that were inconsistent with those made on two prior occasions." (*Ibid.*)

The fraudulent intent element must be associated with a material matter. In *Schnadig* the court did not condone certain practices of the patentee, but denied the fraud and unclean hands defenses since there was no evidence to show that "pertinent and material evdience was concealed from the Patent Office." (*Id.*, p. 392). In *Charles Pfizer, supra*, the court referred to facts which were so material that the patent would not have been issued by the hearing examiner but for the misrepresentation or withholding of said facts. An earlier opinion in the same case, *American Cyanamid Company v. F.T.C.*, 363 F.2d 757 (6th Cir. 1966), set forth a number of "material questions" which were not answered by the evidence, all relating to the hearing examiner's knowledge and state of mind when issuing the patent. *Id.*, p. 777. The Court set forth "ultimate questions" on the issue as being: (1) Did the hearing examiner receive all the information that he had requested? (2) Was the hearing examiner misled and deceived? and (3) Did the hearing examiner grant the patent as the result of such deception? *Id.*, p. 778.

Fraud is not to be lightly inferred. It must be established by "clear, unequivocal and convincing" evidence. *Kearney, supra; Schnadig, supra.* Defendants rely upon numerous factual incidents in arguing that such evidence exists. Consideration of these incidents, singly or in combination, fails to establish clear, unequivocal and convincing evidence of fraud on the Patent Office. Analysis of defendants' allegations will be limited to the most pertinent incidents.

Defendants contend Skil had a duty to disclose the Lucerne device to the Patent Office. Fundamental to this

claim is the invention date of the Lucerne device. If the Lucerne date preceded Gawron's it was obviously material to the Patent Office; however, if the Lucerne device did not precede Gawron it was not material. The precise Lucerne date of invention remains unknown, and, as noted earlier, there is no clear and convincing evidence that the Lucerne device anticipated Gawron. This failure of proof is aggravated when viewed within the context of the dearth of information Lucerne provided Skil during the prosecution period of the Gawron patent. Skil first learned of the Lucerne device in early 1964, nearly sixteen months after filing the Gawron application. During the next twenty months, up to the date the Gawron patent was granted in September of 1965, Lucerne failed to provide Skil with any documentary evidence that the Lucerne device preceded the Gawron application date. Lucerne did no more during this period than claim priority, a claim which under the circumstances Skil had reasonable cause to doubt. In fact Lucerne's counsel essentially conceded in July of 1965 that no proof of prior invention had yet been produced.

The following observation in *H. K. Porter Co., Inc. v. Gates Rubber Co.*, 187 U.S.P.Q. 692, 713 (D.Colo. 1975) applies to Skil's alleged duty to disclose the Lucerne device to the Patent Office:

> The standard of fraudulent non-disclosure is not whether a particular type of . . . [speed control device] was or was not disclosed to the Patent Office, but whether the invention claimed [by Gawron] had been previously made or anticipated by the development of . . . [Lucerne]. That has not been shown, nor is disclosure of all arguably anticipatory products required to avoid charges of misrepresentation to the Patent Office.

It necessarily follows that Skil's use of a Lucerne device to demonstrate the Gawron invention to the patent examiner in March of 1965 was not fraudulent. The Lucerne device had been manufactured as the result of a purchase order from Skil. Its circuitry and method of operation was covered by the Gawron patent. The attraction of the Lucerne device was its retrofit configuration, but this was not an element of the Gawron patent. Even assuming Skil did not inform the Patent Office that it was utilizing the Lucerne retrofit speed control device in its demonstration, there is also no evidence that Skil claimed the retrofit feature as a part of the Gawron invention. Under these circumstances the manufacturing source of the Gawron invention was not material to the Patent Office.

The amendment which Skil filed in March of 1964 placed the SCR speed control circuit in the tool handle. This concept was not pirated from the Lucerne device, rather it came from language in the original Gawron specification, drawing and claims. Moreover, location was not an element of the patent.

In his supplemental oath of May 20, 1965, Mr. Gawron swore in part that "he does not know and does not believe that the same [the Gawron intention] was ever known or used before his invention. . . ." The fact he was aware of the Lucerne speed control device as of February, 1964, did not render his supplemental oath false. Lucerne had yet to produce any evidence that would allegedly prove priority. Under the circumstances it was not unreasonable for Mr. Gawron to hold the belief reflected in his affidavit. *See RPTZ-Patco, Inc. v. Pacific Island Navigation Company*, 253 F.Supp. 796 (D.Or. 1966), *aff'd per curiam*, 377 F.2d 558 (9th Cir. 1967).

Defendants contend fraud on the Patent Office was committed by Skil's alleged misrepresentation of the scope

of the Gemmill prior art patent. The alleged misrepresentation is, at worst, ambiguous, and is subject to being interpreted consistent with the actual scope of Gemmill. Since the actual patent was made available to the patent examiner, thus permitting him to reach an independent decision as to its proper scope, there was no fraud. *See General Tire & Rubber Co. v. Jefferson Chemical Co.*, 363 F.Supp. 871 (S.D.N.Y. 1973), *rev'd on other grounds*, 497 F.2d 1283 (2nd Cir. 1974), *cert. denied*, 419 U.S. 968.

Patent Misuse

Defendants contend that the Gawron patent is unenforceable on the ground Skil misused the patent in obtaining it, and in subsequently marketing it. The guiding doctrine in patent misuse is the equitable maxim that "he who comes into equity must come with clean hands." *Precision Instrument, supra.* The outer scope of the doctrine has not been clearly defined, *see McCullough Tool Company v. Well Surveys, Inc.*, 395 F.2d 230 (10th Cir. 1968), *cert. denied*, 393 U.S. 925; *Hensley Equipment Company v. Esco Corporation*, 83 F.2d 252 (5th Cir. 1967), *modified*, 386 F.2d 442 (5th Cir. 1967); *Stearns v. Tinker & Rasor*, 252 F.2d 589 (9th Cir. 1958); nonetheless, a common example of patent misuse is noted in *Morton Salt Co. v. Suppiger*, 314 U.S. 488, 491 (1941):

> A patent operates to create and grant to the patentee an exclusive right to make, use and vend the particular device described and claimed in the patent. But a patent affords no immunity for a monopoly not within the grant . . ., and the use of it to suppress competition in the sale of an unpatented article may deprive the patentee of the aid of a court of equity to restrain an alleged infringement by one who is a competitor.

See also, Scarfetta, Joseph Jr., *"Ten Years After ARO II: The Effect of Patent Act Section 271 On the Patent Misuse Doctrine"*, 58 J. Pat. Off. Soc'y 69 (1976).

The defense is based upon public policy considerations. It is not personal in the sense that the misuse must be directed at the infringement suit defendant; however, it cannot be based upon "misuse in the air". The misuse must be of the matter in litigation, to wit, misuse of the patent in suit. An anti-trust offense does not necessarily amount to misuse merely because it involves patented products or products which are the subject of a patented process. *Kolene, supra.*

Did the below cost sales to J. C. Penney of Skil products which incorporated the Gawron invention constitute patent misuse? Products which incorporated the Gawron invention were either sold below cost or at a profit. There is no showing that the total sales to J. C. Penney of products incorporating the Gawron invention were sold at an overall loss. Moreover, as to those products which were sold below cost, and which also incorporated the invention, there is no showing that the below cost sales were made by reason of the Gawron invention. Indeed, other below costs sales to J. C. Penney were made of products which did not incorporate the Gawron invention. There is simply no evidence to show that the Gawron invention was a factor in determining whether to sell certain products below cost to J. C. Penney, nor is there any evidence to show that the sale of certain Skil tools was tied to the sale of the Gawron invention. There is also no evidence showing that the below cost sales adversely affected Wen. Under these circumstances the defendants have failed to show misuse of the Gawron invention based upon the J. C. Penney account.

The goal and efforts of Skil to obtain an exclusive position in the field of trigger speed control did not constitute a patent misuse. The evidence shows that Skil did

no more with its Gawron application and patent than legally entitled. Any allegedly objectionable activities of Skil did not involve use of the Gawron patent.

Skil's cancellation of its license agreement concerning the Gawron invention, coupled with its notification to customers of Lucerne that said agreement was cancelled, did not constitute patent misuse. Fundamental to this contention is the issue of whether Skil had the legal right to cancel the agreement, which is an issue involving principles of contract law rather than patent misuse.

Skil's conduct before the Patent Office did not constitute patent misuse. While it is difficult to clearly define the outer boundaries of patent misuse, one difference between it and fraud on the Patent Office is that the patent misuse may be purged, after which the patent may once again be enforced, whereas fraud on the Patent Office infects the initial grant of the patent, thus is not capable of being purged. *See Kearney & Trecker, supra.* Skil's conduct before the Patent Office is more appropriately considered under the issue of fraud on the Patent Office.

Under all the circumstances the defendants have failed to show that any conduct of Skil constituted patent misuse.

Devices Covered By the Gawron Patent

In determining whether a patent has been infringed by an accused device two tests must be applied. The first test is whether there is literal infringement of the patent. In making this determination, the words of the patent claim must be compared with the accused device. If the accused device is clearly within the claim, then infringement does exist. If there is no literal infringement the second test must be applied, that being the doctrine of equivalents. *Acme Highway Products Corp. v. D. S. Brown Co.*, 473 F.2d 849 (6th Cir. 1973), cert. *denied*, 414

U.S. 824. These tests of infringement are equally applicable to the issue of whether the accused Lucerne devices come within the Gawron patent for the purposes of the license agreement between Skil and Lucerne. *Maxon v. Maxon Construction Company*, 395 F.2d 330 (6th Cir. 1968); *Cold Metal Process Co. v. United Engineering & Fdry. Company*, 235 F.2d 224 (3rd Cir. 1956).

Lucerne manufactured two basic forms of speed control devices: (1) the TSC 113/114 model and (2) the TSC 254 model. The TSC 113/114 model literally infringes the Gawron patent; therefore, it is covered by the license agreement.

The major issue concerns the TSC 254 device. Since its timing circuit is in a parallel relationship with the motor, and the claims of the Gawron patent are limited to a series relationship, it does not literally infringe the Gawron patent. Thus it must be analyzed pursuant to the second test, the doctrine of equivalents.

Skil may invoke this doctrine if the TSC 254 performs substantially the same function in substantially the same way to obtain the same result. A finding of equivalence is a determination of fact, which relies upon the following considerations, *Graver Mfg. Co. v. Linde Co.*, 339 U.S. 605, 609 (1950):

> What constitutes equivalency must be determined against the context of the patent, the prior art, and the particular circumstances of the case. Equivalence, in the patent law, is not the prisoner of a formula and is not an absolute to be considered in a vacuum. It does not require complete identity for every purpose and in every respect. In determining equivalents, things equal to the same thing may not be equal to each other and, by the same token, things for most purposes different may sometimes be equivalents.

Consideration must be given to the purpose for which an ingredient is used in a patent, the qualities it has when combined with the other ingredients, and the function which it is intended to perform. An important factor is whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was.

The Sixth Circuit defines the "essence" of the doctrine as, *Cardinal of Adrian, Inc. v. Peerless Wood Prod. Inc.*, 515 F.2d 534, 540 (6th Cir. 1975): "'if two devices do the same work in substantially the same way and accomplish substantially the same result, they are the same, even though they differ in name, form or shape'".

The inventive concept of the Gawron patent is the use of human feedback in combination with a trigger and SCR circuitry to achieve speed control. The limitation in the Gawron patent of connecting the timing circuit in series relationship with the motor does not pertain to the inventive concept of Gawron, but rather to its environment; therefore, the series connection does not preclude reliance on the doctrine of equivalents. *Olympic Fastenings Systems, Inc. v. Textron, Inc.*, 504 F.2d 609 (6th Cir. 1974), *cert. denied*, 420 U.S. 1004.

The Lucerne TSC 254 and a Gawron patent device do the same work since each controls the amount of voltage and current being supplied to the motor, hence the motor speed. Both do this work in substantially the same way since each combines the same electrical and mechanical components with human feedback. Both accomplish the same result since each achieve speed control. Under these circumstances the TSC 254 is equivalent to a device literally covered by the Gawron patent. Skil is entitled to royalties under the license agreement for the sales of the TSC 254 devices.

Cancellation of the License Agreement

In November of 1970 Skil cancelled its 1965 license agreement concerning the Gawron patent. Skil contends that Lucerne's breach of contract permitted cancellation; whereas, Lucerne contends Skil had no right to cancel, and the license agreement remains in effect.

Since the agreement had no express term of years it was in effect for the lifetime of the Gawron patent. During this term neither party had the unilateral right to cancel or terminate the agreement, without cause, outside the express provisions therein. *St. Paul Plow Works v. Starling*, 140 U.S. 184 (1891); *Motor Parts Co. v. Packard Co.*, 124 Ohio St. 363 (1931); *Ohio Citizens Trust Co. v. Air-Way Electric App. Corp.*, 56 F.Supp. 1010 (N.D.Ohio 1944); *Deye v. Quality Engraving & Electrotype Co.*, 60 Ohio Law Abstract 387 (Ohio Com. Pl. Ct. 1950), *reversed on other grounds*, 90 Ohio App. 324 (1951), *appeal dismissed*, 157 U.S. 514 (1952).

Lucerne breached the license agreement by failing to pay royalties on either type of speed control device. Between 1964 and late 1968 Lucerne failed to pay royalties on its TSC 113/114 model despite conceding that royalties were due. Lucerne's failure to pay royalties on the TSC 254 device, first manufactured in 1968, was based upon the honest argument that it was not covered by the Gawron patent. Since the TSC 254 is within the patent, failure to pay royalties thereon constituted a breach of contract. Moreover, Lucerne's 1968 notification that it would not pay any royalties on the TSC 254 constituted an anticipatory breach of all future quarterly payments due on that device. *Morpul, Inc. v. Crescent Hosiery Mills*, 265 F.Supp. 270 (E.D.Tenn. 1967); *see also Wallace Clark & Co., Inc. v. Acheson Industries, Inc.*, 422 F.Supp. 20 (S.D.N.Y. 1976).

There is no cancellation clause in the license agreement for the nonpayment of royalties; however it is unnecessary to determine whether Lucerne's failure to pay royalties gave Skil the right to cancel. A right of cancellation may be waived by the licensor. *Specialities Development Corp. v. C-O-Two Fire Equipment Co.*, 207 F.2d 753 (3rd Cir. 1953); *Miami Cycle & Mfg. Co. v. Robinson*, 245 F. 556 (6th Cir. 1917); *Washburn & Moen Manuf'g. Co. v. Cincinnati Barbed Wire F. Co.*, 42 F. 675 (S.D.Ohio 1890); H. Einhorn, Patent Licensing Transactions (1978); § 4.03 (a); R. Nordhaus, Patent License Agreements (1967), § 44; R. Ellis, Patent Licenses (3rd Ed. 1958), § 316. It was held in *Kittle Mfg. Co. v. Davis*, 47 P.2d 1068, 8 Cal. App. 2d 504 (1935) that when a licensee failed to pay royalties the licensor had a right to treat the license agreement as terminated and sue for damages, or he had a right to sue on the agreement for royalties, but he could not do both. The right to terminate was waived when he sued for recovery of royalties. *See generally, English v. Nat'l. Cas. Co.*, 138 Ohio St. 166 (1941).

In 1968 Skil sued Lucerne for royalties due on the Gawron license. Skil did not ask the court to cancel the agreement, rather Skil asked the court to treat the agreement as binding and order royalties be paid on both the TSC 113/114 and TSC 254 devices. By filing its 1968 lawsuit seeking royalties allegedly due on the contract Skil waived whatever right it had to cancel for the past nonpayment of royalties.

Lucerne continued to manufacture its first type of speed control device, the TSC 113/114, a few months beyond the 1968 filing of Skil's lawsuit. However, the conduct of Skil which constituted a waiver continued beyond the filing date. Thereafter, Skil sought summary judgment on the Gawron license, and partial summary

judgment was entered on June 13, 1969, ordering Lucerne to account for all speed control devices sold under the license agreement. This judgment included the remaining 1968 manufacture of the TSC 113/114. Seeking and obtaining this summary judgment in 1969 constituted a waiver of any right Skil had to cancel by reason of Lucerne's failure to pay royalties on the TSC 113/114 devices manufactured subsequent to the lawsuit filing date.

After 1968 Lucerne exclusively manufactured the TSC 254 device, thus Lucerne's continuing failure to pay royalties in 1969, 1970, and thereafter, was related to its contention that the TSC 254 was not covered by the Gawron license. Since this continuing failure to pay had been anticipated in 1968 (*Morpul, supra; Wallace Clark & Co., supra*) any right to cancel based thereon had been waived by filing the lawsuit.

In summary, the conduct of Skil in filing its lawsuit, and obtaining a partial summary judgment thereon, acted as a waiver of any right it had to cancel the license agreement based upon nonpayment of royalties. The remaining issue is whether there was other conduct of Lucerne which gave Skil the right to cancel in 1970.

The license agreement is not completely silent as to a right to cancel. It gives such a right under certain conditions relating to the licensor's failure to stop infringement by third persons; however, there is no cancellation provision in the event of action or inaction by the licensee. There being no relevant cancellation provision, it was necessary for Skil to show that Lucerne had either abandoned the contract or done something so gravely violative of its terms that irreparable injury resulted to Skil. *Cold Metal Process Co. v. United Engineering & F. Co.*, 107 F.2d 27 (3rd Cir. 1939), *see generally, Ellis, supra*, § 394. Ellis notes that to permit termination by the licensor

the conduct of the licensee must be such as to indicate an intention to repudiate the contract. *Id.*, § 306; *see generally, Cantor v. Cantor*, 86 Ohio Law Abstract, 452 (Ohio Prob. Ct. 1959).

In 1970, subsequent to *Lear, supra*, but prior to Skil's November declaration of cancellation, the summary judgment against Lucerne was vacated and Lucerne was permitted to allege invalidity of the Gawron patent as a defense to Skil's 1968 lawsuit. This assertion of patent invalidity was not inconsistent with Lucerne continuing to maintain that the license agreement remained in effect. *PPG Industries, Inc. v. Westwood Chemical, Inc.*, 530 F.2d 700 (6th Cir. 1976), *cert. denied*, 429 U.S. 824; *Warner-Jenkinson Co. v. Allied Chemical Corp.*, 567 F.2d 184 (2nd Cir. 1977). The seeming inequity of permitting a licensee to keep his license while at the same time he attacks patent validity is outweighed by the public interest in placing no impediment in the way of those in the best position to contest validity of the underlying patent. *Lear, supra*; *Warner-Jenkinson, supra*.

The circumstances of this case are similar to those in *Crane Co. v. Aeroquip Corporation*, 356 F.Supp. 733, 364 F.Supp. 547 (N.D.Ill. 1973), *aff'd in pert. part*, 504 F.2d 1086 (7th Cir. 1974), wherein: (1) the licensee modified the originally licensed product, (2) the licensee refused to pay royalties on the modified product, (3) there was an honest dispute as to whether the modified product was covered by the underlying patent, and (4) the licensee challenged validity of the underlying patent. *Crane* ruled that the licensor was not permitted to terminate the license agreement. Those post-*Lear* precedents cited by Skil (*Warner-Jenkinson, supra*; *Nebraska Engineering Corp. v. Shivvers*, 557 F.2d 1257 (8th Cir. 1977); and *Kraly v. National Distillers and Chemical Corporation*, 502 F.2d 1366

(7th Cir. 1974)) involved dissimilar circumstances, including the absence of one or both of the following factors which are in this case: (1) the license agreement failed to contain a cancellation clause in the event of any action or inaction by the licensee; and (2) there was an honest dispute as to whether an accused product (which was a modification of the product being manufactured at the time the license agreement was initially entered into) came within the terms of the Gawron patent.

The only remaining arguably relevant conduct of Lucerne is that Skil heard from its licensees that Lucerne was holding itself out as a licensed source. However, there was no showing that Lucerne was doing so in any manner inconsistent with the allegations of Skil's 1968 complaint that Skil and Lucerne had a license agreement, and that they disagreed as to whether the TSC 254 was covered by said agreement. It was not shown that Lucerne told others its TSC 254 came within the Gawron license.

Based upon (1) the absence of any provision in the license agreement permitting cancellation by reason of any action or inaction of the licensee, and (2) Skil's 1968 lawsuit for royalties due on the agreement, Skil did not have the right to cancel in 1970. Skil's recovery is limited to whatever relief is permitted under the agreement.

Relief

Skil is entitled to interest on the unpaid royalties from the time when they should have been paid. *Gridiron Steel Co. v. Jones & Laughlin Steel Corp.*, 361 F.2d 791 (6th Cir. 1966). The rate of interest when not stipulated is six percent per annum under Ohio law. Ohio Rev. Code § 1343.03. When simple interest is computed to the royalties due under the Gawron license the total

is two hundred ninety-two thousand four hundred ninety dollars ($292,490.00). Since the Skil-Lucerne license agreement remains in effect this total of royalties plus interest is owed to Skil by Lucerne.

The other corporate defendants, as purchasers of the accused speed control devices from Lucerne, are not liable under any theory for the royalties and interest since they purchased from a licensed source. *Boston Store v. American Graphophone Co.*, 246 U.S. 8 (1918); *Bauer v. O'Donnell*, 229 U.S. 1 (1912); *Extractol Process v. Hiram Walker & Sons*, 153 F.2d 264 (7th Cir. 1946); *see generally*, 4 Deller's Walker on Patents (2d Ed.), §§ 386, 391.

Since the license agreement has remained in effect there has been no infringement of the Gawron patent, thus Mr. Matthews is not liable for infringement. Having signed the license agreement as president of Lucerne he is not personally liable on the contract. *Centennial Insurance Co. v. Vic Tanny International*, 46 Ohio App. 2d 137 (1975). Under these circumstances Mr. Matthews is not liable for the royalties and interest due Skil.

THE FRENZEL PATENT

Validity

The 1977 ruling of Judge Lambros, plus the fact Mr. Matthews was not made a party defendant until 1977, changed the circumstances from those in existence when the 1970 summary judgment was entered concerning the Frenzel patent. These changes are sufficient to permit the validity of Frenzel to be placed in issue.

Defendants contend that the Frenzel patent was obvious. The presumption of validity which attached to Frenzel is not applicable to the Skil Model 823 impact wrench prior art since this wrench was not considered

by the Patent Office. *Eisele v. St. Amour*, 423 F.2d 135 (6th Cir. 1970); however, the only expert testimony provided was that of Mr. Gawron, who distinguished it from Frenzel. The defendants failed to challenge this testimony and failed to provide any expert testimony that either the Skil wrench or other pertinent prior art rendered Frenzel obvious to a mechanic of ordinary skill in the art. Under these circumstances the following caution in *Kardulas v. Florida Machine Products Company*, 438 F.2d 1118, 1124 (5th Cir. 1971), applies:

> Defendant put on no expert testimony. Before a court concludes that it has no need for expert testimony to examine the nature of the prior art or the level of skill in the relevant industry, it should be convinced the claim invention would have been obvious even to ordinary laymen of modest intelligence. . . . To substitute our own judgment concerning the obviousness of the device as of December 1960 'is to substitute our ignorance for the acquaintance with the subject of those who were familiar with it' at that time.

The invention of the Frenzel patent relates to the relative position between the reversing lever and the trigger of a hand held tool. While the Frenzel patent does not appear overly complicated, this court is not convinced that the invention thereof would have been obvious even to ordinary laymen of modest intelligence.

The Frenzel patent is valid in all essential elements.

Fraud on the Patent Office and Patent Misuse

Defendants have failed to show that the necessary elements of materiality and fraudulent intent (discussed in detail concerning the Gawron patent) were present to constitute fraud on the Patent Office during Skil's prose-

cution of the Frenzel patent. The failure to cite the Skil Model 823 impact wrench as prior art was not shown to be a deliberate misrepresentation. *See RPTZ-Patco, supra.*

Defendants' patent misuse allegations must also fail, for many of the same reasons set forth with reference to the Gawron patent. There was no discernible pattern or practice of tying the Frenzel invention to any product in the sales of Skil products to J. C. Penney, nor was there evidence to show the Frenzel patent influenced pricing policy.

Devices Covered by the Frenzel Patent

The Model A reversing switch literally infringes Frenzel, thus is covered by the Frenzel license. The major issue concerns Model B.

An invention is construed not only in light of the patent claims, but also with reference to the patent specification, drawings and file wrapper history. *See, Graham, supra, Autogiro Company of America v. United States,* 384 F.2d 391, (Ct. Cl. 1967); *Tilotson Manufacturing Co. v. Textron, Inc., Homelite,* 337 F.2d 833 (6th Cir. 1964); *Moon v. Cabot Shops, Inc.,* 270 F.2d 539 (9th Cir. 1959), *cert. denied,* 361 U.S. 965; *Thabet Mfg. Co. v. Koolvent Metal Awning Corp.,* 226 F.2d 207 (6th Cir. 1955). Consideration of these various references leads to the conclusion that the Lucerne Model B reversing switch is not covered by the Frenzel patent, either literally or as an equivalent, for two basic reasons.

First, when a drill with the Model B switch is held and operated by the right hand the reversing lever is naturally, and most efficiently, operated by the right thumb. Since a limitation of Frenzel is that the trigger

finger must engage and operate the reversing lever, the Model B switch does not come within Frenzel.

Second, a change of grip on the handle is necessary to permit the trigger finger to simultaneously touch both the trigger and the Model B reversing lever, which negatives the requirement of Frenzel that the finger operating the trigger simultaneously engage or operate the reversing lever. The trigger finger can no longer operate the trigger within the meaning of Frenzel if the normal operating grip has been changed.

Relief

When simple interest is computed to the royalties due on the Model A reversing switch under the Frenzel license the total is one thousand five hundred eighty-nine dollars ($1,589.00). Under the license agreement this sum is owed to Skil by Lucerne.

Mr. Matthews is not liable to Skil under the Frenzel license agreement for the same reason set forth with reference to the Gawron patent.

SUMMARY

The Gawron patent is valid and enforceable. The Lucerne TSC 113/114 and TSC 254 speed control devices are covered by the Gawron patent. The 1965 Skil-Lucerne license agreement with reference to the Gawron patent remains in effect. None of the defendants has infringed the Gawron patent. Lucerne remains liable to Skil under the terms of the license agreement for royalties plus interest totaling two hundred ninety-two thousand four hundred ninety dollars ($292,490.00). Mr. Matthews is not liable to Skil on this agreement or on any other basis. The corporate defendants other than Lucerne are not liable to Skil on this agreement or on any other basis.

The Frenzel patent is valid and enforceable. The Lucerne Model A reversing switch is covered by the patent, but the Lucerne Model B reversing switch is not covered by the patent. Lucerne is liable to Skil under the license agreement for royalties plus interest due totaling one thousand five hundred eighty-nine dollars ($1,589.00). Mr. Matthews is not liable to Skil under this license agreement or on any other basis.

Lucerne is liable to Skil on the two patents combined for a total amount of two hundred ninety-four thousand seventy-nine dollars ($294,079.00), while none of the other defendants are liable to Skil.

/s/ Jack B. Streepy
United States Magistrate

MEMORANDUM OPINION AND ORDER OF THE UNITED STATES DISTRICT COURT

(Filed February 22, 1980)

Consolidated Cases Nos. C69-461 and C74-121

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO
EASTERN DIVISION

SKIL CORPORATION,
a corporation,
Plaintiff,

vs.

LUCERNE PRODUCTS, INC.,
a corporation,

and

BENJAMIN H. MATTHEWS,
an individual,
Defendants.

The consolidated cases, C 69-461 and C 74-121, sound in suit for royalties under a licensing agreement and patent infringement. The issues are centered upon two patents owned by plaintiff—U.S. Patent No. 3,209,228, in the name of Alex F. Gawron ("Gawron Patent"), titled "System For Controlling Electric Motors in Power Tools and The Like;" and U.S. Patent No. 3,260,827 in the name of Carl J. Frenzel ("Frenzel Patent"), titled "Motor Reversing Mechanism For Electrically Powered Portable Tools."

These consolidated cases were referred to the Honorable Jack B. Streepy, Magistrate for the United States District Court, Northern District of Ohio, Eastern Division. 28 U.S.C. §636(b)(2). Magistrate Streepy was authorized by this Court, with the written permission of the parties, to try these cases as a special master under the provisions of Rule 53 of the Federal Rules of Civil Procedure.

The Magistrate conducted a twenty-one day trial, which developed over 3600 pages of testimony and over 400 exhibits. He considered proposed findings of fact and conclusions of law from both parties and extensive post-trial memoranda. The result was a well-reasoned, concise and clear Report and Recommended Decision, filed with the Court on March 9, 1979.

On March 19, 1979, defendants[1] filed "Objections of

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1. It is unclear whether all defendants or merely defendant Lucerne filed the document labeled "Objections of Defendants to the Magistrate's Report Filed on March 9, 1979." The title of the document indicates several defendants, yet the language of the memorandum refers only to defendant Lucerne. Given that the other defendants were not adversely treated by the recommendations of the Magistrate, the memorandum appears to be Lucerne's doing.

Defendants to the Magistrate's Report Filed on March 9, 1979" with this Court. This document is a shocking display of groundless *ad hominem* attacks on the Magistrate, crude solecisms, and incoherent analysis and argument.[2] The memorandum alleges a "pattern of prejudiced rationalization" in the actions of the Magistrate, and refers to this actions in preparing the report as "chicanery." These attacks are not supported by any evidence other than the fact that the Magistrate, in reaching his conclusion, decided certain legal issues contrary to the wishes of defendant. This Court readily acknowledges defense counsel's expertise in the field of patent law and continues in its respect for counsel's legal abilities and reputation in the legal community; therefore, the Court can only conclude that counsel was driven to this excess by the length, difficulty and unfavorable result of the hearing—and this is understandable. However, the Magistrate's reputation is questioned by these attacks, and the allega-

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2. To give one of many examples, and this not the most offensive of the lot, the following paragraph from the memorandum (p. 4) is offered. It purports to be an explanation of defendant's objection to the abbreviation by ellipses of a quotation in the Magistrate's report from *Precision Instrument Mfg. Co. v. Automotive Maintenance Machinery Co.*, 324 U.S. 806, 818 (1945):

> Patentably [sic] that conclusion could not be made if the omitted sentences in the Precision Instrument's case had been included. The omissions were deliberately designed and used to emasculate the law as laid down by the Supreme Court and used to cover up the fraud of the plaintiff herein with the Cloak of Justice.
>
> Now when these omissions are coupled with the previous item of "Priority of Invention" a pattern of prejudiced rationalization appears which taints the entire Report of the Magistrate. Unfortunately, there are times when overzealous counsel resorts [sic] to such tactics, but surely this cannot be excused as an innocent oversight when resorted to by an officer of the Court charged with the duty to apply the principles laid down by the highest court in the nation. We therefore object to the above conclusions as being contrary to law, and look to this Court to take the proper measures to rectify this abuse of justice by the chicanery of its hearing officer as hereinabove disclosed.

tions are certainly undeserved. Therefore, this Court directs that all passages in defendant's memoranda that make personal attack upon the Magistrate beyond the parameters of legal argument and analysis be stricken. Federal Rules of Civil Procedure, Rules 7(b)(2) and 11.

I.

Rule 53(e)(2) provides that "the court shall accept the master's findings of fact unless clearly erroneous. Professors Moore and Lucas explain the purpose of the rule in this way:

> The mandate of Rule 53(e)(2), as applied in the typical case where the master who makes the findings of fact is the one who heard the parties and the testimony is based on hard common sense: the master, as a judicial officer, must as a general proposition be trusted as to factual matters, particularly those involving oral and disputed testimony. [5A Moore's Federal Practice ¶53.12[4] (1979), footnotes omitted.]

Thus, it is inappropriate for this Court to retry the case—to reexamine all of the evidence and reweigh it—unless defendant can make an initial showing that the Magistrate made a clearly erroneous appraisal of the weight of the evidence.

Defendant's objections to the findings of fact, however, do not go to the heart of the clearly erroneous appraisal standard. Defendant's initial objections are to those findings relating to the nonobviousness of the Gawron patent in the light of the state of prior art in 1962. The Magistrate found that the use of human feedback in a variable-speed trigger tool to obtain a constant rotational speed was not obvious to one skilled in the art at the time of the patent's approval. [Finding 8(c), Magistrate's

Report (hereafter, "MR").] The Magistrate reached this conclusion by carefully comparing all prior related patents with the Gawron patent and by considering the testimony of various experts, all of which resulted in substantial evidence in support of a finding of non-obviousness. Defendant may disagree with the weight given to various evidence and testimony by the Magistrate, but this is not cause for a finding of 'clearly erroneous' by this Court. Defendant seeks to have the Magistrate's findings specifically state all of the evidence presented by defendant in this matter, but this is not the purpose of the Findings of Fact. The Magistrate is granted authority to weigh and sift the evidence and then to distill the evidence into a summary of the material facts upon which conclusions of law may be based. So long as there is substantial evidence on the record to support this distillation, this Court may not discard it. The Court has carefully gone over the record and finds substantial support for the Findings made by the Magistrate.

The same problem is present in defendant's remaining objections to the Findings of Fact. Defendant disputes the weight given by the Magistrate to the various documents, evidence and testimony offered, and complains that the Magistrate failed to include all the evidence presented by defendant into the Findings of Fact. As explained above, these arguments are not appropriate to this Court's decision to accept and adopt the findings of the Magistrate, *vel non*. The Court has carefully considered the record, and finds that there is substantial support therein for the Findings of the Magistrate.

II.

A different standard of review applies to the Magistrate's Conclusions of Law. These have no effect except

to the extent that they are correct propositions of law. 5A Moore's Federal Practice ¶53.12[5] (1979). Defendant's objection to the Conclusions of Law are based upon the Magistrate's analysis of *Precision Investment Manufacturing Co. v. Automotive Maintenance Machinery Co.*, 324 U.S. 806 (1945), which case deals with the defense of fraud on the patent office in a patent infringement action.

Defendants argue that several examples of fraud by plaintiff can be found in the circumstances of the Gawron patent application. Most of these examples have a common nexus—the failure of plaintiff to disclose defendant's device to the patent office when seeking the Gawron patent.

In early March of 1965, both plaintiff and defendant had patent applications for the Gawron-type device pending. The patent examiner had twice rejected plaintiff's patent application, and the parties decided to enter into an agreement in furtherance of their mutual interests respecting the pending patents. [MR, p. 19]. Negotiations culminated in an agreement dated March 9, 1965, between Skil and Lucerne that provided that parties would disclose evidence relating to patent rights to each other. The parties would then decide if they could agree on the import of the evidence; failing agreement, parties would ask the Patent Office to set up an interference to determine patent rights. [MR, pp. 19-20]. They disclosed their respective patent applications to each other on the day the agreement was concluded.

On March 16, 1965, plaintiff demonstrated its device to the patent examiner by operating a variable-speed-control drill that incorporated plaintiff's claimed invention. The invention was embodied in a Lucerne speed control device that plaintiff had purchased from defendant Lucerne. Apparently, the examiner was not informed that Lucerne had made the device for Skil. Six days later,

plaintiff again amended its application and, this time, the application was allowed by the examiner. On May 20, 1965, Mr. Gawron executed a supplemental oath, stating in part that ". . . he does not know and does not believe that the same [Gawron invention] was even known or used before his invention thereof." [MR., pp. 20-21].

The Magistrate began his thorough analysis of these facts by pointing out that the Sixth Circuit deals with the fraud defense by requiring that the party asserting the defense prove 'specific intent', that is, intent to defraud. *Kearney & Trucker Corp. v. Cincinnati Milocron, Inc.*, 562 F.2d 365 (6th Cir. 1977); *Kolene Corporation v. Motor City Metal Treating Inc.*, 440 F.2d 77 (6th Cir. 1971), *cert. den.*, 404 U.S. 886. Further, the specific intent must be associated with a material matter. *Schnadig Corporation v. Gaines Manufacturing Co., Inc.*, 494 F.2d 383 (6th Cir. 1974).[3]

Defendant admits that this statement of the law is correct [see footnote 3, *supra*], and also does not dispute or object to the Magistrate's Findings of Fact on this issue. Defendant builds its argument on the following language from *Precision Instrument*, especially the emphasized sentence:

> Those who have applications pending with the Patent Office or who are parties to Patent Office proceedings have an uncompromising duty to report to it all facts concerning possible fraud or inequitableness underlying the applications in issue. [citations] *This duty is not excused by reasonable doubts as to the suffi-*

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3. Defendant admits that these tests—specific intent and materiality—are essential to the fraud defense doctrine on pages 7, *et seq.* of its initial memorandum of objections. Defendant, in fact, cites and quotes *Norton v. Curtiss*, 433 F.2d 779 (Ct. of Customs and Patent Appeals 1970), for these rules of law.

> *ciency of the proof of the inequitable conduct nor by resort to independent legal advice.* Public interest demands that all facts relevant to such matters be submitted formally or informally to the Patent Office which can then pass upon the sufficiency of the evidence. [at 818, emphasis added.]

Defendant argues that plaintiff's failure to disclose the pendency of the Lucerne application cannot be justified by plaintiff's assertion that, despite an agreement by defendant to give plaintiff evidence of reduction to practice and first inventorship, no evidence was forthcoming. Given the Magistrate's determination that the Lucerne device was covered by the Gawron patent application terms and that the device was ordered by Skil and produced by Lucerne with Skil's advice and assistance[4], this Court fails to see how the Patent Office could have been misled as to the claims of the Gawron Patent by failure of Skil to reveal who had produced the demonstration device.[5]

With respect to Lucerne's claim that Skil failed to reveal the pendency of the Lucerne application to the patent examiner, it is true that a failure "to call attention to material and relevant prior art" will support a defense of fraud. *Buzzelli v. Minnesota Mining & Manufacturing Co.*, 521 F.2d 1162, at 1163 (6th Cir. 1975). *Buzzelli* in fact quotes the passage from *Precision Instrument* on which defendant has based its claim. However, defendant has misanalyzed the sentence emphasized in the quotation, *supra*, from that passage. That sentence explains that

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4. Magistrate's Report, p. 17, Finding #31. Note that Skil even supplied some of the production equipment.

5. Keep in mind that all actions of Skil prior to November 24, 1964, are irrelevant here because the patent examiner denied the application as amended on that date, and thus, actions prior to that date could not be material to the later acceptance of the application.

a mere showing that plaintiff had doubts about the relevance of a pending application or relied on legal advice, does not, of itself, excuse a failure to reveal; yet, it would be ludicrous to assume that an applicant is therefore required to reveal all applications that could conceivably be argued to have some relationship to the patent being urged. The passage shows only that legal advice is not *per se* an excuse from charges of fraud.

In fact, *Buzzelli* suggests that the prior art must be shown to have been material and relevant before a failure to reveal would be considered fraudulent. The Findings of the Magistrate make it clear that the Lucerne application did not meet these criteria. The heart of the matter is the invention date of the Lucerne device. If the Lucerne date preceded Gawron's invention, the Lucerne application was material to the Patent Office. If not, the Lucerne invention date made no difference. The later date of the Lucerne invention, then, makes disclosure immaterial. *See, H.K. Porter Co., Inc. v. Gates Rubber Co.*, 187 U.S.P.Q. 692 (D.C. Colo. 1975). The matter is brought into sharper perspective when it is remembered that Skil first learned of the Lucerne device in early 1964, nearly sixteen months after filing the Gawron application. During the next twenty months, up to the date the Gawron patent was granted in September of 1965, Lucerne failed to provide Skil with any documentary evidence that the Lucerne device preceded the Gawron application date. Lucerne did no more during this period than claim priority, a claim that, under the circumstances, Skil had reasonable cause to doubt. In fact, Lucerne's counsel essentially conceded in July of 1965 that no proof of prior invention had yet been produced. [MR, p. 57.]

III.

On March 14, 1979, the Magistrate ordered that the 1977 counterclaim antitrust issues be severed from this case and that a previously issued 1977 order staying all proceedings as to those counterclaims be terminated. Defendants objected to the appropriateness of this action by the Magistrate and he therefore rephrased the Order of March 4 into a Report and Recommendation of April 17, 1979. The Court sees the wisdom of such an Order in promoting efficiency within its docket. Rule 42(b) of the Federal Rules of Civil Procedure.

IV.

The Court hereby adopts in full and without change or exception the Report and Recommendation of the Magistrate of March 9, 1979, and the Report and Recommendation of the Magistrate of April 17, 1979. These Reports are attached hereto as Appendices A and B and are made a part hereof and their recommended actions shall be the Order of this Court. This Court commends the Magistrate for a careful and thorough examination of the facts and the law.

IT IS SO ORDERED.

/s/ Thomas D. Lambros
United States District Judge

FINAL JUDGMENT OF THE UNITED STATES DISTRICT COURT

(Filed February 22, 1980)

Consolidated Cases Nos. C69-461 and C74-121

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO
EASTERN DIVISION

SKIL CORPORATION,
a corporation,
Plaintiff,

vs.

LUCERNE PRODUCTS, INC.,
a corporation,

and

BENJAMIN H. MATTHEWS,
an individual,
Defendant.

In keeping with the Memorandum Opinion and Order of this Court of even date herewith, this Court adopts in full and without change or exception the Report and Recommendation of the Magistrate of March 9, 1979, and that of April 17, 1979. These Reports are attached hereto as Appendices A and B and are made a part hereof and their recommendations are the Order of this Court.

These cases are terminated.

IT IS SO ORDERED.

/s/ Thomas D. Lambros
United States District Judge

ORDER OF THE UNITED STATES COURT OF APPEALS FOR THE SIXTH CIRCUIT DENYING PETITION FOR REHEARING

(Filed August 31, 1982)

NO. 80-3170

UNITED STATES COURT OF APPEALS
FOR THE SIXTH CIRCUIT

SKIL CORPORATION,
Plaintiff-Appellee,

v.

LUCERNE PRODUCTS, INC.,
Defendant-Appellant.

BEFORE: MERRITT and JONES, *Circuit Judges,* and PHILLIPS, *Senior Circuit Judge.*

Upon consideration, no judge having favored rehearing en banc, the Court concludes that the issues raised in the petition for rehearing were fully considered upon the original submission and decision of the appeal. Accordingly, the petition for rehearing is DENIED.

ENTERED BY ORDER OF THE COURT

/s/ JOHN P. HEHMAN
Clerk

AGREEMENT BETWEEN SKIL CORPORATION AND LUCERNE PRODUCTS, INC., DATED MARCH 9, 1965 (GAWRON LICENSE)

AGREEMENT

This Agreement, entered into this 9th day of March, 1965, by and between SKIL CORPORATION, a corporation of the State of Delaware, having a place of business at Chicago, Illinois, hereinafter referred to as "SKIL", and LUCERNE PRODUCTS, INC., a corporation of the State of Ohio, having a place of business at Northfield, Ohio, hereinafter referred to as "LUCERNE"

WITNESSETH THAT:

WHEREAS, LUCERNE is a manufacturer of motor control switch units and SKIL is a user of such units, has developed switch units itself, and is a customer of LUCERNE, and

WHEREAS, LUCERNE and SKIL have become aware that they have pending applications in the United States Patent Office relating to motor control switch units of the type manufactured by LUCERNE and used or developed by SKIL, which applications may have claims to common subject matter or may support claims to common subject matter,

WHEREAS, in the interest of continued friendly relations between SKIL and LUCERNE, it is desirable that a Patent Office interference be avoided and that the parties hereto decide between themselves as to which party is entitled to any patent or patents which may issue covering said common subject matter.

NOW, THEREFORE, in consideration of the mutual undertakings of the parties hereto, it is agreed by and between them as follows:

1. SKIL and LUCERNE shall instruct their attorneys to make a mutual disclosure of the patent applications referred to above but only with respect to applications relating to a motor control switch unit whereby motor speed is controlled by a squeezing action on a trigger type switch, and said attorneys shall determine whether there is common subject matter in such patent applications, and, if so, said attorneys shall compare proofs as to date of inventorship of the respective inventions of SKIL and LUCERNE, whereupon claims to any such common subject matter shall be prosecuted only in the patent application of the party having the earliest proof of inventorship as determined according to the interference rules of the United States Patent Office, provided that if said attorneys cannot agree as to which party hereto is entitled to the claim or claims to such common subject matter, the Patent Office will be requested to set up an interference to determine which of the parties hereto is entitled to the claim or claims covering such common subject matter.

2. If and when a patent covering said common subject matter issues to either SKIL or LUCERNE following the procedure outlined in Paragraph 1 hereof, then the party owning such patent shall grant to the other party hereto a non-exclusive license to make, have made, use or sell motor speed control switch units covered by the claims of said patent, which license shall include a royalty rate of three per cent (3%) of the licensee's price, less returns for credit, of said units covered by said patent, or a lower royalty rate mutually agreed upon by the parties hereto, it being understood that if another license is granted with a lower rate than the royalty rate specified

herein, such lower royalty rate shall be substituted for the royalty rate in said non-exclusive license, it being further understood that the party hereto who becomes a licensee under said non-exclusive license shall not be permitted to grant sub-licenses to others, except for its own requirements of said switch units.

3. It shall be the duty of LICENSOR under this Agreement to sue infringers of whatever patent may be obtained and to retain any recoveries from such litigation. If LICENSEE under this Agreement shall call LICENSOR's attention to a case of infringement, and no suit is filed to stop such infringement, or a license granted, within six months of the date of such notice, LICENSEE may then place earned royalties in escrow under this Agreement until such infringement is stopped or licensed. If such infringement is stopped, or a license granted, then such escrow royalties shall be paid to LICENSOR. If such infringement is not stopped by means of such suit or license, then LICENSEE shall retain such escrow royalties and this Agreement shall be cancelled. If, in the case of a given infringement, LICENSOR does not file a suit to stop such infringement or grant a license within six months of notice, LICENSEE may file an infringement suit at its own option and expense and in the LICENSOR's name, or may cancel this Agreement. In the event LICENSEE does bring suit, then LICENSEE may retain any recoveries from such litigation and withhold royalties due under this Agreement up to one-half of the cost of prosecuting the infringement suit.

4. This Agreement shall be binding upon and inure to be the benefit of the successors and assigns of the parties hereto.

IN WITNESS WHEREOF, this Agreement has been executed in duplicate the day and year first above written

by the officers of SKIL and LUCERNE duly authorized by their respective Boards of Directors.

Skil Corporation
Attest: By /s/ James L. McManus
/s/ Clarence J. Fleming Its Secretary

Lucerne Products, Inc.
Attest: By /s/ Benj. H. Matthews
/s/ George S. Baldwin Its Pres.

ADDENDUM TO AGREEMENT BETWEEN SKIL CORPORATION AND LUCERNE PRODUCTS, INC., DATED NOVEMBER 15, 1965

ADDENDUM

In consideration of One Dollar ($1.00) and other good and valuable consideration hereby acknowledged as received by each party from the other, SKIL CORPORATION, a corporation of Delaware, and LUCERNE PRODUCTS, INC., a corporation of Ohio, hereby agree that the Agreement between them entered into the 9th day of March, 1965 be amended to add the following paragraphs:

(5) In the event LUCERNE, following the procedure outlined in Paragraph (1) hereof, obtains (a) the allowance of a claim or claims covering said common subject matter, or (b) any of the claims of Gawron Patent No. 3,209,228, all right, title and interest in and to a patent, hereinafter referred to as the "Skil Patent", containing such claim or claims and the invention defined thereby shall, immediately upon issuance thereof, become the property of and be sold, assigned, transferred, and set over to SKIL, and in witness thereof, LUCERNE shall promptly thereafter execute an appropriate written assignment. Concurrently

with issuance of said "Skil Patent", SKIL, by a written agreement, shall grant to LUCERNE a non-exclusive, royalty-free license to manufacture, use and sell devices or components thereof covered by said "Skil Patent".

(6) Should said "Skil Patent" issue and be assigned to SKIL pursuant to Paragraph (5) hereof, SKIL shall pay to LUCERNE a sales price for said "Skil Patent" equivalent to twenty per cent (20%) of any net royalty received by SKIL from any license or licenses granted to another or others by SKIL for the manufacturer, use and sale of devices or components thereof covered by said "Skil Patent". By net royalty is meant the balance remaining after the deduction from the gross royalty received by SKIL of the cost and expense of granting licenses and of litigation involved in suing infringers or contributory infringers of said "Skil Patent".

(7) SKIL shall have the duties and obligations of LICENSOR as set forth in Paragraph (3) hereof with respect to said "Skil Patent" as set forth in Paragraph (5) hereof.

(8) Whenever royalties or sales price is to be paid under this agreement the party required to pay shall within thirty days of the close of each calendar quarter, account to the other party for the amount due and owing for that immediately preceding calendar quarter and accompany the account with a check for the amount shown to be due, if any. The party to whom the account is made shall have the right to inspect the books or records of the accounting party pertaining to these accounts at all reasonable times.

Lucerne Products, Inc.
By /s/ Benj. H. Matthews
President

Attest:
/s/ [illegible]

Skil Corporation
By /s/ John Sullivan
President

Attest:
/s/ James L. McManus
Secretary

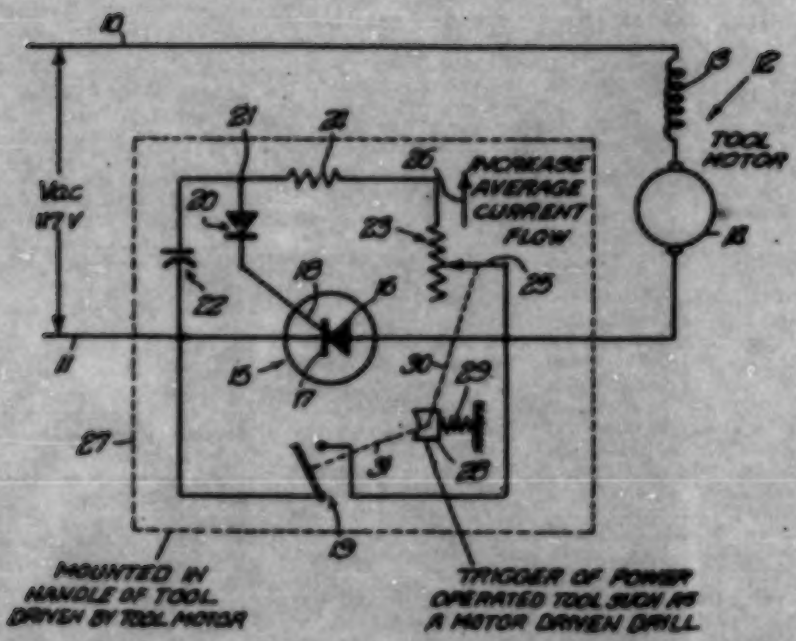
PLAINTIFF'S EXHIBIT 1

GAWRON PATENT 3,209,228

Sept. 28, 1965 A. F. GAWRON 3,209,228

SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE

Filed Sept. 28, 1962



I hereby certify that this instrument is a true and correct copy of the original on file in my office.

Clerk, U.S. District Court

Northern District of Ohio

By: Vincent D. Manarese
Deputy Clerk

INVENTOR.
Alex F. Gawron.
BY
Cornwell & Quist + Worden
ATTYS

United States Patent Office

3,209,228

Patented Sept. 28, 1965

3,209,228

SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE

Alex F. Gawron, Chicago, Ill., assignor to Skil Corporation, Chicago, Ill., a corporation of Delaware

Filed Sept. 28, 1962, Ser. No. 226,956
4 Claims. (Cl. 318—345)

This invention relates, generally, to electric motor control systems and it has particular relation to the control of the voltage and current applied to, and thereby the speed of, such well known electric motor driven tools, as a universal motor driven hand drill, reciprocating saw, sander, or the like. For example, Papworth Patent 2,931,402 dated April 5, 1960, discloses a reciprocating saw in which the invention can be incorporated.

Among the objects of this invention are: To provide for controlling the flow of current from an alternating current source to a load device, such as a universal motor in a hand manipulated drill or other tool of the class described, in a new and improved manner; to employ for this purpose a silicon controlled rectifier in series with the motor; to provide a capacitor for triggering the silicon controlled rectifier at a predetermined time in a half cycle of alternating current that it is adapted to conduct by varying the time rate at which voltage is applied to the capacitor in the half cycle; to vary the time rate by a variable resistor or potentiometer connected in series with the capacitor with the series combination being connected across the silicon controlled rectifier; to mount the motor and control devices in series therewith on the handle of a power driven tool; to provide a trigger on the handle connected to the variable resistor for varying the resistance in series with the capacitor; to provide a switch for shunting the silicon controlled rectifier; and to mount the switch on the handle and interconnect it and the variable resistor with the trigger in such manner that the switch is closed when the resistance in series with the capacitor has been reduced to a predetermined value.

In the drawing the single figure illustrates, diagrammatically, a preferred embodiment of this invention.

In the diagram of circuit connections the reference characters 10 and 11 designate conductors that are energized from a suitable source of alternating current operating at a frequency of 60 cycles and at a voltage of 117 volts. The frequency and voltage here mentioned are conventional and typical of the alternating current source that can be employed for energizing the system embodying the present invention. Connected for energization between the conductors 10 and 11 is a load device, indicated generally at 12, that is in the form of a universal or series type motor. The motor 12 includes a series field winding 13 and an armature winding 14, these windings being connected in series in accordance with conventional practice.

In order to control the flow of current to the load device 12 and the voltage applied thereto a silicon controlled rectifier, indicated generally at 15, is connected in series circuit relation with the load device 12. The silicon controlled rectifier 15 includes an anode 16, a cathode 17 and a gate or control electrode 18. It will be understood that the silicon controlled rectifier 15 acts to conduct half cycles of alternating current of one polarity and to block the flow of the half cycles of the alternating current of opposite polarity. When it is desired to apply both half cycles of alternating current at the voltage existing between the conductors 10 and 11 to the load device 12, a switch, shown generally at 19, can be closed. It will be observed that the switch 19 is connected in shunt with the silicon controlled rectifier 15 and that, when it is closed, the load device 12 is energized directly from the conductors 10 and 11 without the interposition of the silicon controlled rectifier 15.

In order to cause the silicon controlled rectifier 15 to become conducting in the half cycle of the alternating current that it is adapted or forward biased to conduct a control or trigger diode 20 is connected to the gate or control electrode 18. The control or trigger diode 20 is interposed between the gate or control electrode 18 and a common connection 21 between a capacitor 22, which is connected to the cathode 17 of the silicon controlled rectifier 15, and a variable resistor or potentiometer 23 that is connected to the anode 16 of the silicon controlled rectifier 15. A limiting resistor 24 can be provided between the common connection 21 and the variable resistor or potentiometer 23 to make certain that the voltage in this portion of the circuit is maintained above a predetermined minimum voltage.

The variable resistor or potentiometer 23 has an adjustable contact 25 that is movable to vary the resistance in series with the capacitor 22 for the purpose of varying the time rate voltage build up on the capacitor 22 in the half cycle during which the silicon controlled rectifier 15 is adapted to conduct a half cycle of the alternating current. When the adjustable contact 25 is moved in the direction indicated by the arrow 26, the voltage applied to the capacitor 22 is increased with the result that the silicon controlled rectifier 15 is rendered conducting at an earlier point in the half cycle of alternating current that it is adapted to conduct with the result that the voltage and current applied to the load device 12 are correspondingly increased. When the adjustable contact 25 is moved in the opposite direction there is a corresponding reduction in the voltage and current applied to the load device 12. Since only a relatively small amount of current flow takes place through the variable resistor or potentiometer 23 and since the voltage drop across the silicon controlled rectifier 15 is relatively small, the amount of heat generated is correspondingly small. As a result the control devices associated with the silicon controlled rectifier 15 and the silicon controlled rectifier 15 itself can be mounted in a handle or other convenient portion of the tool, indicated by the broken line outline at 27, of the power driven tool with the load device in the form of the universal or series type motor 12 being mounted on the handle in conventional manner. Because of the relatively low heat dissipation of the control circuits, the amount of heat developed is relatively small and not uncomfortable to the hand of the operator grasping the handle. If heating is apt to be a problem, the circuits may be mounted in the cooling jet stream of the motor housing.

It is desirable that the resistance of the variable resistor or potentiometer 23 be variable under the control of the operator. For this purpose a trigger 28 is employed and it is slidably mounted on the handle in accordance with conventional practice. A spring 29 serves to bias the trigger 28 to the one operated position against a stop (not shown). A mechanical connection, indicated by broken line 30, interconnects the trigger 28 with the adjustable contact 25 with the arrangement being such that as the trigger 28 is depressed against the spring 29, the adjustable contact 25 is moved in the direction indicated by the arrow 26 to reduce the resistance in the circuit including the capacitor 22 for the purpose of obtaining an increase in the voltage and current applied to the load device 12 in the manner outlined above. A mechanical connection, indicated by the broken line 31, serves to interconnect the trigger 28 and the switch 19 with the arrangement being such that, when maximum voltage and current have been applied to the load device 12 by the control of the silicon controlled rectifier 15, further and maximum voltage and current are applied by closure of the switch 19. As pointed out above this places the load

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device 12 directly across the line conductors 10 and 11 so that the full system voltage is applied.

As it is apparent to those skilled in the art, the circuit shown and described does not have inherent speed feedback. However, essentially constant speed under varying load conditions can be readily obtained by manipulation of the trigger which is under the operator's control at all times during operation of the tool.

What is claimed as new is:

1. In an electrical control system, the combination with an electric motor having series connected armature and field windings, which motor is mounted in a tool housing having a handle portion, of a silicon controlled rectifier in series circuit relation with said motor and the series combination arranged and adapted for energization from an alternating current source; said rectifier including an anode, a cathode and a gate; a series connected variable resistor and capacitor connected respectively to said anode and cathode, a connection interconnecting said gate and the common connection between said resistor and said capacitor, variation in the resistance of said resistor in series with said capacitor effecting a corresponding change in the voltage and current applied to said motor, said devices connected in series with said motor being mounted in said handle portion, and a trigger on said portion connected to said variable resistor for changing the resistance in series with said capacitor, manipulation of said trigger serving as the sole means for controlling the speed of said motor.

2. In an electrical control system, the combination with an electric motor having series connected armature and field windings, which motor is mounted in a tool housing having a handle portion, of a silicon controlled rectifier in series circuit relation with said motor and the series combination arranged and adapted for energization from an alternating current source; said rectifier including an anode, a cathode and a gate; a series connected variable resistor and capacitor connected respectively to said anode and cathode, a connection interconverting said gate and the common connection between said resistor and said capacitor, variation in the resistance of said resistor in series with said capacitor effecting a corresponding change in the voltage and current applied to said motor, a switch connected in shunt circuit relation with said silicon controlled rectifier and when closed causing said motor to be energized directly from said current source, said devices connected in series with said motor and said switch being mounted in said handle portion, and a trigger on said handle portion connected to said variable resistor for changing the resistance in series with said capacitor and to said switch for closing it when said resistance has been reduced a predetermined extent, said variable resistor in series with said capacitor constituting the sole means for changing the voltage and current applied to said motor.

3. In combination, a hand manipulated power tool having a housing with a handle portion, wherein the tool includes an electric motor with series connected armature and field windings, an electrical control system for said motor, which control system is mounted in said housing and includes, a silicon controlled rectifier control circuit in series circuit relation with said motor and arranged and adapted for energization from an alternating current source, said circuit including a variable resistor for varying the voltage and current applied to said motor thereby to control the speed thereof, a trigger supported on said handle portion, said trigger being mechanically connected to the movable element of said resistor for operation of the latter upon actuation of the trigger, whereby said control system is actuated by said trigger for controlling the speed of said motor, variation in the voltage and current applied to said motor being accomplished solely through operation of said variable resistor by said trigger.

4. In combination, a hand manipulated power drill including a housing having a hollow handle, wherein the drill includes an electric motor with series connected armature and field windings, an electrical control system mounted in said hollow handle and including, a silicon controlled rectifier control circuit in series circuit relation with said motor and arranged and adapted for energization from an alternating current source, said circuit including a variable resistor for varying the voltage and current applied to said motor thereby to control the speed thereof, a trigger supported on said handle, said trigger being mechanically connected to the movable element of said resistor so that as the trigger is depressed the resistance of said resistor is reduced thereby to increase the speed of said motor, variation in the voltage and current applied to said motor being accomplished solely through operation of said variable resistor by said trigger.

References Cited by the Examiner

UNITED STATES PATENTS

2,419,431	4/47	Williams	318—212 X
3,103,618	9/63	Slater	318

FOREIGN PATENTS

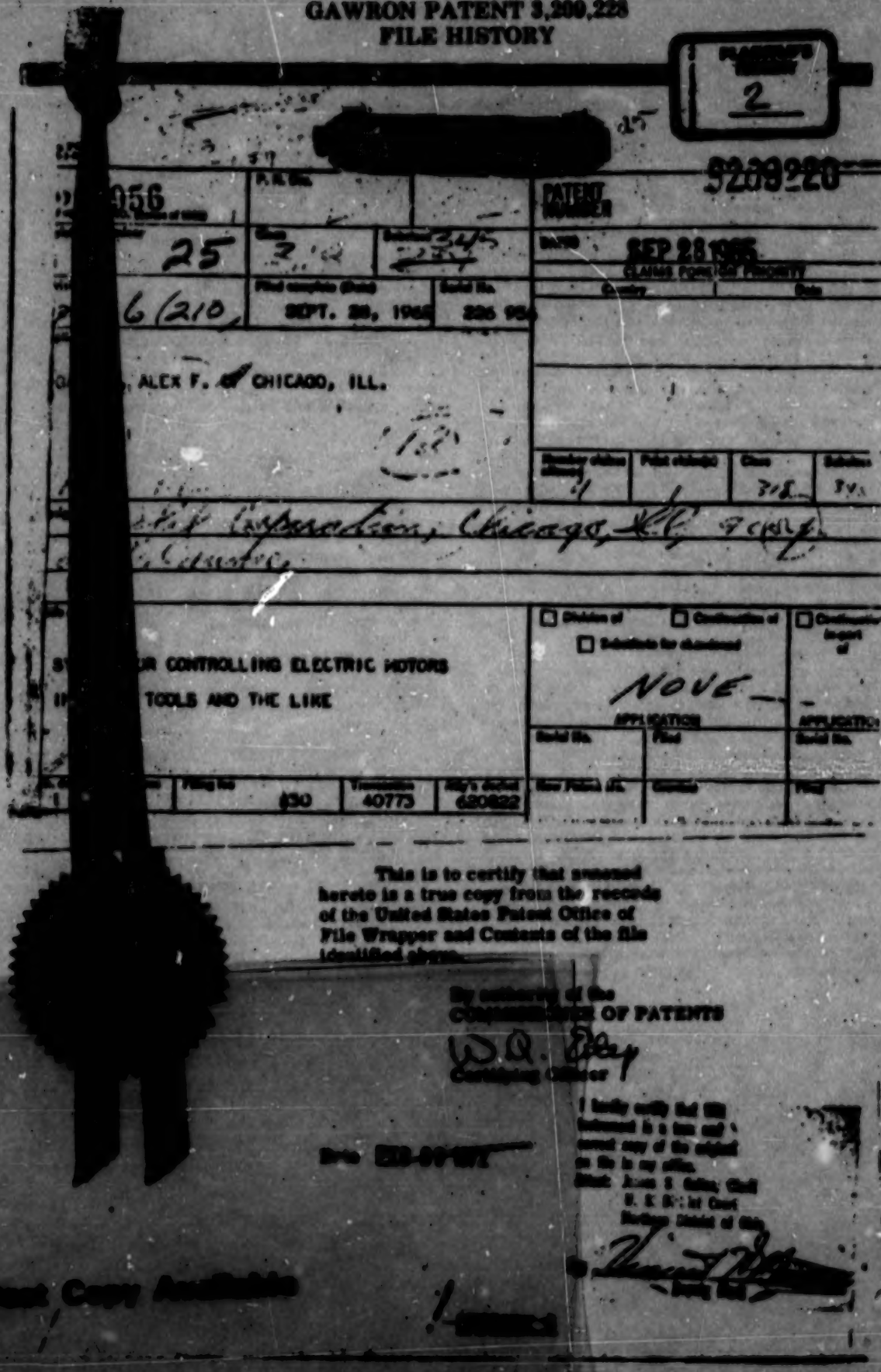
242,179	12/62	Australia.

OTHER REFERENCES

Publication: Gutzwiller, G.E. Application Note 200.4, 6/61, Universal Motor Speed Controls, June 1961.

ORIS L. RADER, *Primary Examiner.*

GAWRON PATENT 3,209,228
FILE HISTORY



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26956	P. R. Div.		PATENT NUMBER 3209226
25	Class	Subclass 345	DATED SEP 28 1965
26(210)	Filed complete (Date) SEPT. 28, 1962	Serial No. 226 954	CLAIMS FOREIGN PRIORITY: Country / Date

GAMRON, ALEX F. of CHICAGO, ILL.

Number claims allowed: 4 | Print claim(s): 1 | Class: 318 | Subclass: 345

Assigned to Stewart-Warner Corporation, Chicago, Ill., a corporation of Delaware.

Title of invention

SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE

☐ Division of ☐ Continuation of ☐ Substitute for abandoned — NONE — APPLICATION

☐ Continuation-in-part of APPLICATION

No. drwg.	Sheets drawing	Filing fee	Examiner	Atty's docket
1		$30	40775	620822

Serial No. | Filed | Int. Class(s) | Group | Filed

Send correspondence to: Attorney or Agent

CRAWFORD, GREIST & MARDEN

38 S. DEARBORN STREET,

CHICAGO, ILL.

Attorney(s) CRAWFORD, GREIST & MARDEN of Chicago

PARTS OF APPLICATION FILED SEPARATELY

PREPARED FOR ISSUE

EXAMINED AND PASSED FOR ISSUE

GROUP 2

NOTICE OF ALLOWANCE MAILED JUL 2 1965

FINAL FEE

Date JUL 8 1965 Amount $30

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FRANKLIN M. WARDEN
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FRED S. LOCKWOOD
GUY A. GREENAWALT
JOHN D. DEWEY

RECEIVED
SEP 25 1962
PATENT OFFICE

September 27, 1962

Hon. Commissioner of Patents
Washington 25, D. C.

Re: Case 620822 - Alex F. Gawron -
System for Controlling Electric
Motors in Power Tools and the Like

Sir:

We forward herewith for filing the above identified application together with one (1) sheet of drawings.

We also enclose our check for $30.00 application to cover the filing fee.

Respectfully,

CROMWELL, GREIST & WARDEN

By Fred S. Lockwood

FSL:nb
Enclosures

1/2

A107 Case 620822 15518

SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE 226053

This invention relates, generally, to electric motor control systems and it has particular relation to the control of the voltage and current applied to, and thereby the speed of, such well known electric motor driven tools, as a universal motor driven hand drill, reciprocating saw, sander, or the like. For example, Papworth Patent 2,931,402 dated April 5, 1960, discloses a reciprocating saw in which the invention can be incorporated.

Among the objects of this invention are: To provide for controlling the flow of current from an alternating current source to a load device, such as a universal motor in a hand manipulated drill or other tool of the class described, in a new and improved manner; to employ for this purpose a silicon controlled rectifier in series with the motor; to provide a capacitor for triggering the silicon controlled rectifier at a predetermined time in a half cycle of alternating current that it is adapted to conduct by varying the time rate at which voltage is applied to the capacitor in the half cycle; to vary the time rate by a variable resistor or potentiometer connected in series with the capacitor with the series combination being connected across the silicon controlled rectifier; to mount the motor and control devices in series therewith on the handle of a power driven tool; to provide a trigger on the handle connected to the variable resistor for varying the resistance in series with the capacitor; to provide a switch for shunting the silicon controlled rectifier; and to mount the switch on the handle and interconnect it and the variable resistor with the trigger in such manner that the switch is closed when the resistance in series with the capacitor has been reduced to a predetermined value.

In the drawing the single Figure illustrates, diagrammatically, a preferred embodiment of this invention.

In the diagram of circuit connections the reference characters 10 and 11 designate conductors that are energized from a suitable source of alternating current operating at a frequency of 60 cycles and at a voltage of 117 volts. The frequency and voltage here mentioned are conventional and typical of the alternating current source that can be employed for energizing the system embodying the present invention. Connected for energization between the conductors 10 and 11 is a load device, indicated generally at 12, that is in the form of a universal or series type motor. The motor 12 includes a series field winding 13 and an armature winding 14, these windings being connected in series in accordance with conventional practice.

In order to control the flow of current to the load device 12 and the voltage applied thereto a silicon controlled rectifier, indicated generally at 15, is connected in series circuit relation with the load device 12. The silicon controlled rectifier 15 includes an anode 16, a cathode 17 and a gate or control electrode 18. It will be understood that the silicon controlled rectifier 15 acts to conduct half cycles of alternating current of one polarity and to block the flow of the half cycles of the alternating current of opposite polarity. When it is desired to apply both half cycles of alternating current at the voltage existing between the conductors 10 and 11 to the load device 12, a switch, shown generally at 19, can be closed. It will be observed that the switch 19 is connected in shunt with the silicon controlled rectifier 15 and that, when it is closed, the load device 12 is energized directly from the conductors 10 and 11 without the interposition

of the silicon controlled rectifier 15.

In order to cause the silicon controlled rectifier 15 to become conducting in the half cycle of the alternating current that it is adapted or forward biased to conduct a control or trigger diode 20 is connected to the gate or control electrode 18. The control or trigger diode 20 is interposed between the gate or control electrode 18 and a common connection 21 between a capacitor 22, which is connected to the cathode 17 of the silicon controlled rectifier 15, and a variable resistor or potentiometer 23 that is connected to the anode 16 of the silicon controlled rectifier 15. A limiting resistor 24 can be provided between the common connection 21 and the variable resistor or potentiometer 23 to make certain that the voltage in this portion of the circuit is maintained above a predetermined minimum voltage.

The variable resistor or potentiometer 23 has an adjustable contact 25 that is movable to vary the resistance in series with the capacitor 22 for the purpose of varying the time rate voltage build up on the capacitor 22 in the half cycle during which the silicon controlled rectifier 15 is adapted to conduct a half cycle of the alternating current. When the adjustable contact 25 is moved in the direction indicated by the arrow 26, the voltage applied to the capacitor 22 is increased with the result that the silicon controlled rectifier 15 is rendered conducting at an earlier point in the half cycle of alternating current that it is adapted to conduct with the result that the voltage and current applied to the load device 12 are correspondingly increased. When the adjustable contact 25 is moved in the opposite direction there is a corresponding reduction in the voltage and current applied to the load device 12. Since only a relatively small

amount of current flow takes place through the variable resistor or potentiometer 23 and since the voltage drop across the silicon controlled rectifier 15 is relatively small, the amount of heat generated is correspondingly small. As a result the control devices associated with the silicon controlled rectifier 15 and the silicon controlled rectifier 15 itself can be mounted in a handle or other convenient portion of the tool, indicated by the broken line outline at 27, of the power driven tool with the load device in the form of the universal or series type motor 12 being mounted on the handle in conventional manner. Because of the relatively low heat dissipation of the control circuits, the amount of heat developed is relatively small and not uncomfortable to the hand of the operator grasping the handle. If heating is apt to be a problem, the circuits may be mounted in the cooling jet stream of the motor housing.

It is desirable that the resistance of the variable resistor or potentiometer 23 be variable under the control of the operator. For this purpose a trigger 28 is employed and it is slidably mounted on the handle in accordance with conventional practice. A spring 29 serves to bias the trigger 28 to the non operated position against a stop (not shown). A mechanical connection, indicated by broken line 30, interconnects the trigger 28 with the adjustable contact 25 with the arrangement being such that as the trigger 28 is depressed against the spring 29, the adjustable contact 25 is moved in the direction indicated by the arrow 26 to reduce the resistance in the circuit including the capacitor 22 for the purpose of obtaining an increase in the voltage and current applied to the load device 12 in the manner outlined above. A mechanical connection, indicated by the broken

line 31, serves to interconnect the trigger 28 and the switch 19 with the arrangement being such that, when maximum voltage and current have been applied to the load device 12 by the control of the silicon controlled rectifier 15, further and maximum voltage and current are applied by closure of the switch 19. As pointed out above this places the load device 12 directly across the line conductors 10 and 11 so that the full system voltage is applied.

What is claimed as new is:

1. In an electrical control system, the combination with an electric motor having series connected armature and field windings, of a silicon controlled rectifier in series circuit relation with said motor and the series combination arranged and adapted for energization from an alter- ting current source; said rectifier including an anode, a cathode and a gate; a series connected variable resistor and capacitor connected respectively to said anode and cathode, and a rectifier interconnecting said gate and the common connection between said resistor and said capacitor, variation in the resistance of said resistor in series with said capacitor effecting a corresponding change in the voltage and current applied to said motor.

2. In an electrical control system, the combination with an electric motor having series connected armature and field windings, of a silicon controlled rectifier in series circuit relation with said motor and the series combination arranged and adapted for energization from an alternating current source; said rectifier including an anode, a cathode and a gate; a series connected variable resistor and capacitor connected respectively to said anode and cathode, a rectifier interconnecting said gate and the common connection between said resistor and said capacitor, variation in the resistance of said resistor in series with said capacitor effecting a corresponding change in the voltage and current applied to said motor, and a switch connected in shunt circuit relation with said silicon controlled rectifier and when closed causing said motor to be energized directly from said current source.

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15525

3. In an electrical control system, the combination with an electric motor having series connected armature and field windings, with the motor so mounted in a tool having a handle portion, of a silicon controlled rectifier in series circuit relation with said motor and the series combination arranged and adapted for energization from an alternating current source; said rectifier including an anode, a cathode and a gate; a series connected variable resistor and capacitor connected respectively to said anode and cathode, a rectifier interconnecting said gate and the common connection between said resistor and said capacitor, variation in the resistance of said resistor in series with said capacitor effecting a corresponding change in the voltage and current applied to said motor, said motor and devices connected in series therewith being mounted on a handle, and a trigger on said handle connected to said variable resistor for changing the resistance in series with said capacitor.

15527

4. In an electrical control system, the combination with an electric motor having series connected armature and field windings, which motor is mounted in a tool housing having a handle portion, of a silicon controlled rectifier in series circuit relation with said motor and the series combination arranged and adapted for energization from an alternating current source; said rectifier including an anode, a cathode and a gate; a series connected variable resistor and capacitor connected respectively to said anode and cathode, a rectifier connection interconnecting said gate and the common connection between said resistor and said capacitor, variation in the resistance of said resistor in series with said capacitor effecting a corresponding change in the voltage and current applied to said motor, a switch connected in shunt circuit relation with said silicon controlled rectifier and when closed causing said motor to be energized directly from said current source, said motor and devices connected in series with said motor therewith including said switch being mounted in said handle portion, and a trigger on said handle portion connected to said variable resistor for changing the resistance in series with said capacitor and to said switch for closing it when said resistance has been reduced a predetermined extent.

5. In an electrical control system, the combination with an electric motor having series connected armature and field windings, of a silicon controlled rectifier in series circuit relation with said motor and the series combination arranged and adapted for energization from an alternating current source; said rectifier including an anode, a cathode and a gate; a series connected variable resistor and capacitor connected respectively to said anode and cathode, a rectifier interconnecting said gate and the common connection between said resistor and said capacitor, variation in the resistance of said resistor in series with said capacitor effecting a corresponding change in the voltage and current applied to said motor, a switch connected in shunt circuit relation with said silicon controlled rectifier and when closed causing said motor to be energized directly from said current source, and means commonly connected to said variable resistor and to said switch for changing the resistance in series with said capacitor and for closing said switch when said resistance has been reduced a predetermined extent.

Case 620822

OATH, POWER OF ATTORNEY, AND PETITION

Being duly sworn, I, ALEX F. GAWRON depose and say that I am a citizen of the United States, residing at Chicago, in the County of Cook, and State of Illinois: that I have read the foregoing specification and claims and I verily believe I am the original, first, and sole inventor of the invention or discovery in

SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE

described and claimed therein; that I do not know and do not believe that this invention was ever known or used before my invention or discovery thereof or patented or described in any printed publication in any country before my invention or discovery thereof, or more than one year prior to this application, or in public use or on sale in the United States for more than one year prior to this application; that this invention or discovery has not been patented in any country foreign to the United States on an application filed by me or my legal representatives or assigns more than twelve months before this application; and that no application for patent on this invention or discovery has been filed by me or my representatives or assigns in any country foreign to the United States, except as follows:

And I hereby appoint CROMWELL, GREIST & WARDEN, a firm composed of Franklin M. Warden, Raymond L. Greist and Fred S. Lockwood, 38 S. Dearborn Street, Chicago, Illinois, Reg. No. 10793,

my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent Office connected therewith.

Wherefore I pray that Letters Patent be granted to me for the invention or discovery described and claimed in the foregoing specification and claims, and I hereby subscribe my name to the foregoing specification and claims, oath, power of attorney, and this petition, this 26 day of September, 1962.

Inventor Alex F. Gawron
First Name Middle Initial Last Name

Post Office Address 7727 West Farragut Avenue
Chicago 31, Illinois

For sup. Oath see paper #9

STATE OF ILLINOIS }
COUNTY OF COOK } ss

Before me personally appeared ALEX F. GAWRON, to me known to be the person described in the above application for patent, who signed the foregoing instrument in my presence, and made oath before me to the allegations set forth therein as being under oath, on the day and year aforesaid.

Irene F. Caldwell
Notary Public

(SEAL)

My commission exp. 9-24-63

This form may be executed only when attached to a complete application as the last page thereof.

Approved Single Signature Form
(No. [illegible])

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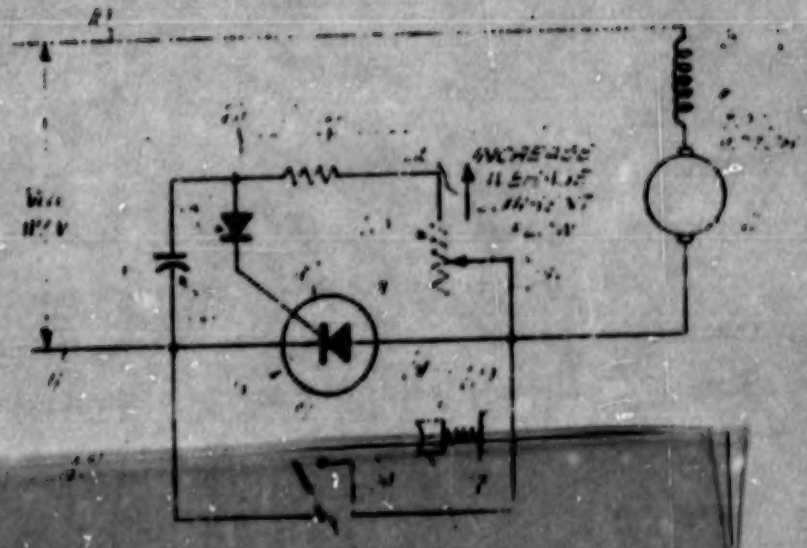
GROUP: 26

JUN 22 1965



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Form No. 3

U. S. DEPARTMENT OF COMMERCE
PATENT OFFICE
WASHINGTON

In Reply Please Refer To:

Cromwell, Greist & Warden
38 S. Dearborn St.
Chicago, Illinois

Applicant: Alex F. Gewron	MAILED
Ser. No. 226,956	
Filed September 28, 1962	DEC 3 1963
For SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE	GROUP 210

Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Patents.

This application has been examined.

References made of record:

Williams 2,419,431 Apr. 22, 1947 318-212x

Publication: Gutzwiller, C.E. Application Note 200.4 6/61, Universal Motor Speed Controls, June 1961 page 2, copy in Group 210.

This application contains claims 1-5 inclusive.

Claims 1 and 3 are rejected as obviously fully met by the publication (Figure 1a) supra. The particular structural limitations are considered immaterial in that the combination of a handle mounted switch to actuate a variable resistance is well known.

Claims 2, 4 and 5 are rejected as substantially met by the publication (Fig. 1a) in view of Williams, both cited above. Williams discloses a system for switching from half wave to full wave energization of a motor by means of a shunting switch (column 4 lines 65-70). It would be obvious and hence not patentable to supply full wave energization to the publication's universal motor by means of a shunting switch as taught by Williams.

All claims are rejected.

SGordon:sw

O.F. Warden
Examiner

13

MAR 4 1964 PATENT OFFICE

Case 620822

IN THE UNITED STATES PATENT OFFICE

In re application of

ALEX F. GAWRON

SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE

Serial No. 226,956

Filed September 26, 1962

Group 210

RECEIVED MAR 6 1964 GROUP 210

NOTICE OF CHANGE OF NAME

Hon. Commissioner of Patents

Washington 25, D. C.

Sir:

Please note that the firm of Cromwell, Greist & Warden, attorneys of record in the above identified application, has changed its name to Greist, Lockwood, Greenawalt & Dewey. This change has been duly entered in the Attorneys' Roster. In accordance with the Rules of Practice, the original Power of Attorney remains in effect.

Respectfully,

CROMWELL, GREIST & WARDEN

By C. J. Fleming

Chicago, Illinois

March 3, 1964

14

5/A

Case 620822

IN THE UNITED STATES PATENT OFFICE

In re application of

ALEX P. GAWRON

SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE

Serial No. 226,956

Filed September 28, 1962

Group 210

RECEIVED
MAR 6 1964
GROUP 210

AMENDMENT

Hon. Commissioner of Patents
Washington 25, D. C.

Sir:

In response to the Office Action mailed December 3, 1963, Paper No. 3, please amend the above entitled application as follows:

In the claims:

Cancel claims 1, 2 and 5.

Add the following claims:

15528

16. In combination, a hand manipulated power tool having a housing, wherein the tool includes an electric motor with series connected armature and field windings, an electrical control system for said motor, which control system is mounted in said housing and includes, a silicon controlled rectifier control circuit in series circuit relation with said motor and arranged and adapted for energization from an alternating current source, said circuit including a variable resistor for varying the voltage and current applied to said motor thereby to control the speed thereof, a trigger supported on said housing, said trigger being mechanically connected to the movable element of said resistor for operation of the latter upon actuation of the trigger, whereby said control system is actuated by said trigger for controlling the speed of said motor.

17. In combination, a hand manipulated power drill having a hollow handle, wherein the drill includes an electric motor with series connected armature and field windings, an electrical control system mounted in said hollow handle and including, a silicon controlled rectifier control circuit in series circuit relation with said motor and arranged and adapted for energization from an alternating current source, said circuit including a variable resistor for varying the voltage and current applied to said motor thereby to control the speed thereof, a trigger supported on said handle, said trigger being mechanically connected to the movable element of said resistor so that as the trigger is depressed the resistance of said resistor is reduced thereby to increase the speed of said motor.

REMARKS

Claims 1, 2 and 5 have been cancelled, and new claims 6 and 7 have been added to cover applicant's invention more completely. It is submitted that all claims now in this application are clearly allowable as they readily distinguish the art cited by the Examiner.

It is believed that it will be useful to review briefly one of the very important objects of applicant's invention to which the claims now in this application are directed. This important object resides in the provision of a practical, small and compact, trigger operated, housing contained electrical control system for a hand manipulated power tool, such as a drill with an electric motor having series connected armature and field windings. This is achieved by employing a silicon controlled rectifier control circuit including a variable resistor. A trigger is mounted on the handle by conventional means and mechanically linked with the movable member of the variable resistor so that actuation of the trigger controls the variable resistor thereby to control the speed of the motor. All components of this control system are compact and may be readily mounted within a housing portion of the tool, such as a pistol-grip type handle of an electric drill. Since in a silicon controlled rectifier circuit only a relatively small amount of current flow takes place through the variable resistor and the voltage drop across the silicon control rectifier is relatively small, this control system generates only a relatively small amount of heat and thereby does not make the handle of the tool uncomfortable to hold in the hand of an operator of the power tool.

In other words, applicant's novel electrical control system is small and compact and readily lends itself to mounting within the handle of the tool without causing heating of the handle.

Heretofore, trigger operated speed control systems for portable appliances or tools have included bulky components requiring a large tool housing and making mounting of these control systems in a handle of a tool rather difficult if not impossible. Further, prior art speed control systems of this type generate a considerable amount of heat thereby causing the housing or handle of the tool to become rather hot which brings about discomfort to the operator of the tool. It is believed that these reasons account for the absence from the market at the present time of a handle contained, trigger operated speed control system for an electric drill.

Applicant's invention for the first time provides an extremely compact, trigger operated control system which may be readily mounted in the housing of a power tool, such as the handle of an electric drill, for example. The advantages of such a control system should be apparent. One of the most important advantages of course is that the over-all size of the tool may be kept to a minimum thereby making the tool easier to manipulate or maneuver by hand and to have the speed of the tool motor controlled by the same hand.

Now looking to the references cited by the Examiner in his rejection of claim 3, the General Electric publication discloses only one form of silicon controlled rectifier circuit. There is no suggestion in this publication of associating the circuit with a tool trigger and mounting the circuit and trigger in the housing of a hand manipulated tool. It is noted that the Examiner has made the statement that the combination of a

handle mounted switch to actuate a variable resistance is well known. However, as explained above, applicant has done much more than this. Further, applicant's variable resistor forms a part of the silicon controlled rectifier control circuit. Since only a relatively small amount of current flows through applicant's variable resistor as it only varies the time rate voltage build-up on the capacitor in the half cycle during which the silicon controlled rectifier is adapted to conduct a half cycle of the alternating current, the variable resistor itself may be relatively small and thereby readily mounted within the confines of a power tool housing.

Claim 4 has been rejected as substantially met by the General Electric publication in view of Williams 2,419,431. Williams has been cited for a showing of switching from half wave to full wave energization of a motor by means of a shunting switch. All claims in this application now readily distinguish the General Electric publication and Williams, as these claims include limitations to applicant's compact control system which may be readily mounted in a tool housing and controlled by a trigger for varying the speed of a series type electric motor.

It is believed that all claims in this application readily distinguish the references cited by the Examiner and are in allowable form. Favorable reconsideration and an early Notice of Allowance are respectfully solicited in the light of the foregoing.

Respectfully submitted,
CROMWELL, GREIST & WARDEN

By C. J. Fleming

Chicago, Illinois
March 3, 1964

19

Form No. 6

U. S. DEPARTMENT OF COMMERCE
PATENT OFFICE
WASHINGTON

In Reply Please Refer To

Lockwood, Greenawalt & Dewey
30 S. Dearborn Street
Chicago, Illinois

Applicant: Alex F. Gamron
Ser. No. 226,456
Filed Sept. 26, 1962
For SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE

MAILED
NOV 25 1964
GROUP 210

Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Patents.

Responsive to amendment filed March 4, 1964.

References made of record:

3,103,618 9/63 Slater 318-TD

References cited of interest:

242,179 12/62 Australia 310-50
(3 pgs. spec., 1 sht. dwg.)

This application contains claims 3, 4, 6 and 7.

Claims 3, 6 and 7 are rejected as fully met by the publication of record for the reasons fully set forth in the rejection of claim 3 of record.

Applicant states:

> the General Electric publication discloses only one form of silicon controlled rectifier circuit. There is no suggestion in this publication of associating the circuit with a tool trigger and mounting the circuit and trigger in the housing of a hand manipulated tool.

(Amendment A, page 4, lines 25-24). However, the publication on its first page contains a typical use of the controlled rectifier circuit would be in hand tools (page 1, lines 12-17).

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Claim 4 is rejected as substantially met by the publication of record in view of Slater supra. Slater (Figure 8) discloses a shunting switch (101) in combination with an controlled rectifier gating circuit. It would be obvious and hence not patentable to substitute the half wave-half cycle gating circuit bypass switch for the half wave gating circuit of the publication.

Claims 3, 4, 6 and 7 are rejected.

THE NORMAL SIX-MONTH PERIOD FOR RESPONSE RUNS FROM THE DATE OF THIS ACTION.

This action is made FINAL under the provisions of Rule 113.

ORIS L. RADER
Oris L. Rader
Examiner

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SGordon:gel
WO 7-4081

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15526

MAIL ROOM MAR 25 1965 U.S. PATENT OFFICE

Case 620822

IN THE UNITED STATES PATENT OFFICE

In re application of

ALEX P. GAWRON

SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE

Serial No. 226,956

Filed September 28, 1962

Group 210

RECEIVED MAR 29 1965 GROUP 210

AMENDMENT UNDER RULE 116

Hon. Commissioner of Patents

Washington, D. C. 20231

Sir:

In response to the Office Action mailed November 25, 1964, Paper No. 6, please amend the above entitled application as follows:

In the claims:

Claim 3, line 3, after the comma insert --which motor is mounted in a tool housing having a handle portion,--

Line 9, delete "rectifier" and insert --connection--

Line 13, delete "motor and"

Line 14, delete "therewith" and insert --with said motor--

Same line, delete "on a handle" and insert --in said handle portion--

Line 15, after "handle" insert --portion--

Line 17, change the period to a comma and add the following --manipulation of said trigger serving as the sole means for controlling the speed of said motor.--

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15529

Claim 4, line 3, after the comma insert --which motor is mounted in a tool housing having a handle portion,--

Line 9, delete "rectifier" and insert --connection--

Line 16, delete "motor and"

Line 17, delete "therewith including" and insert --with said motor and--

Same line, delete "on a handle" and insert --in said handle portion--

Line 18, after "handle" insert --portion--

Line 21, change the period to a comma and add the following --said variable resistor in series with said capacitor constituting the sole means for changing the voltage and current applied to said motor.--

Claim 6, line 2, after "housing" insert --with a handle portion--

Line 11, delete "housing" and insert --handle portion--

Line 14, change the period to a comma and add the following --variation in the voltage and current applied to said motor being accomplished solely through operation of said variable resistor by said trigger.--

Claim 7, line 1, after "drill" insert --including a housing--

Line 13, change the period to a comma and add the following --variation in the voltage and current applied to said motor being accomplished solely through operation of said variable resistor by said trigger.--

In the specification:

Page 5, add the following paragraph at the end of the specification:

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--As it is apparent to those skilled in the art, the circuit shown and described does not have inherent speed feedback. However, essentially constant speed under varying load conditions can be readily obtained by manipulation of the trigger which is under the operator's control at all times during operation of the tool.--

REMARKS

Applicant acknowledges with appreciation the March 19, 1965 interview courteously extended by the Examiner. The Examiner was kind enough to permit a demonstration of a drill incorporating the present invention. A hole was driven in a nail and screws were driven by this drill to demonstrate the speed control and feel which are obtained by the present invention. Several deomonstrations were conducted to show the many new drilling operations that are possible with a drill incorporating the instant invention. Also, a Sears Roebuck drill, similar to the drill shown in the Australian patent cited as of interest by the Examiner, was operated to show the striking differences in speed control and feel between the Sears Roebuck drill and the drill incorporating the subject invention.

During the interview, it was pointed out that the primary reference being relied on by the Examiner in rejecting the applicant's claims, namely the General Electric publication teaches that the Figure 1A circuit (which circuit has been specifically cited) is not suitable for the uses mentioned in

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the publication, because this particular circuit does not have feedback to achieve constant speed characteristics with varying load. It was pointed out to the Examiner that by reason of the applicant's invention a circuit without feedback can be used in a device which in operation encounters varying loads, such as a hand powered tool and in particular a drill, because the variable resistor in the circuit is operated by the tool trigger which is of course under the operator's control, and therefore the operator can readily adjust the variable resistor as he senses increase or decrease in the load thereby to achieve substantially constant speed control under varying load conditions. In other words, applicant's invention with its unique trigger control provides human feedback as opposed to the General Electric publication which teaches the use of circuits having feedback provisions. In the General Electric publication, the circuits shown in Figures 2A, 3A and 5A, which circuits are disclosed as being suitable for the uses mentioned, are all distinguishable from the applicant's circuit since they all have inherent speed feedback.

It was further pointed out during the interview that the applicant is the first in the art to develop a practical, economical and workable trigger operated speed control system for small portable tools, such as power drills. Copies of Ridell Patent 1,027,372, Lee Patent 2,406,389, Sparkl n Patent 2,525,839 and Gemmill Patent 2,609,525 were shown to the Examiner as illustrative of prior art efforts to obtain variable speed control in tools such as drills and mixers.

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These prior art speed controls have been bulky, expensive and impractical for several reasons one of which has been overheating problems. None of these patents in any way relate to a trigger speed control using a silicon controlled rectifier circuit, and in particular the type of circuit which permits the operator of the tool to achieve feedback by finger control.

All claims have been amended to point out and define the applicant's invention along the lines discussed with the Examiner during the interview. Claim 3 has been amended to improve its form and to point out that manipulation of the trigger serves as the sole means for achieving speed control. This limitation distinguishes the General Electric publication which discloses and teaches using silicon controlled rectifier circuits with speed feedback characteristics. The General Electric publication does not teach associating a tool trigger with the variable resistor in a silicon controlled rectifier circuit and clearly the General Electric publication does not show or teach associating the Figure 1A circuit therein with a tool trigger and incorporating such a circuit in a hand tool which is subjected to varying load conditions. In fact, the teaching in the General Electric publication is just the contrary as this publication teaches that a feedback type circuit must be used in devices subjected to varying load conditions.

It should be pointed out that the feedback type circuits of the General Electric publication may be used in drills such as the drill shown in the Australian patent and the Sears Roebuck drill shown to the Examiner, since these

drills do not have trigger speed control but rather speed control knobs associated with the variable resistor. Since these knobs are located on the tool remote from the trigger and cannot be conveniently kept under the control of the operator at all times, a feedback provision must be built into the circuit to achieve constant speed characteristics under varying load conditions. During the interview, it was mentioned and shown that the Sears drill does not permit extreme slow speed operation. It was shown that a drill incorporating the instant invention can be operated at extremely slow speeds and can be made to operate in a stable manner at extremely slow speeds because of the feel which is made possible by the combination of the applicant's circuit and the trigger associated therewith. Silicon controlled rectifier circuits with inherent speed feedback do not permit operator "feel" and do not permit stable operation at slow speeds.

In summary, claim 3 should be allowed as it particularly points out and defines the applicant's invention the essence of which is the provision of a silicon controlled rectifier circuit without inherent feedback in association with a trigger control thereby to permit the operator to achieve feedback by manipulating the trigger in response to sensations received by variations in the load. Claim 3 has also been amended to substitute the word "connection" for "rectifier". It was pointed out during the interview that this limitation was unnecessary; the Examiner indicated he would consent to such an amendment.

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Claim 4 has been amended along the lines of claim 3. Claim 4 differs from claim 3 in that the former includes a limitation to a shunt switch which is also operated by the trigger. Further, claim 4 points out that the variable resistor in series with the capacitor constitutes the sole means for changing the voltage and current to the motor; this limitation readily distinguishes the prior art.

Claim 6, which differs in form from claims 3 and 4, has also been amended along the lines discussed with the Examiner. Particularly, this claim points out that variation in voltage and current to the motor is accomplished solely through the variable resistor which is of course under the operator's control.

Claim 7, which is similar to claim 6 with the exception that claim 7 is directed specifically to a power drill, has also been amended along the lines discussed with the Examiner.

All four claims in the application now particularly point out and define the invention. The Examiner indicated that the claims as amended would be given favorable consideration.

The specification has been amended to point out that the circuit disclosed does not have speed feedback. This concept is of course inherent in the disclosure of the application as filed, and therefore an issue of new matter is not raised.

It is believed that the claims now in this application define applicant's important invention and are of a scope commensurate with his contribution to the art. Favorable consideration and an early Notice of Allowance are earnestly solicited in the light of the foregoing.

Respectfully submitted,

GREIST, LOCKWOOD, GREENAWALT & DEWEY

By C. J. Fleming

Chicago, Illinois 60603

March 24, 1965

ADDRESS ONLY THE COMMISSIONER OF PATENTS WASHINGTON, D.C. 20231

U. S. DEPARTMENT OF COMMERCE
PATENT OFFICE
WASHINGTON

Paper No. 8

In Reply Please Refer To:

Lockwood, Greenawalt & Dewey
38 S. Dearborn Street
Chicago, Illinois

Applicant:	Alex F. Gawron
Ser. No.	226,956
Filed	September 29, 1962
For	SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS ETC.

MAILED
MAR 6 1965
GROUP 210

Communication received March 25, 1965
(Date)

In view of applicant's communication filed on the date indicated above, the Examiner has reconsidered this application and found it allowable.

Prosecution on the merits is hereby closed and the Notice of Allowance or other appropriate communication will be sent in due course.

LOUIS L. RUDER
Examiner

Solicet

PSL-220 (8-64)

USCOMM-DC 7182-P64

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MAIL ROOM MAY 24 1965 U.S. PATENT OFFICE

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Case 620822

IN THE UNITED STATES PATENT OFFICE

In re application of	:	
ALEX F. GAWRON	:	
SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE	:	Group 210
Serial No. 226,956	:	
Filed September 28, 1962	:	

COMMUNICATION

Hon. Commissioner of Patents

Washington, D. C. 20231

Sir:

It is requested that the accompanying Supplemental Oath be filed in this application.

Respectfully submitted,

GREIST, LOCKWOOD, GREENAWALT & DEWEY

By C. J. Thuss

Chicago, Illinois 60603

Area Code 312 - STate 2-4860

May 21, 1965

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MAIL ROOM MAY 24 1965 U.S. PATENT OFFICE

Case 620822

SUPPLEMENTAL OATH

STATE OF ILLINOIS)
COUNTY OF COOK) SS.

ALEX F. GAWRON, whose application for Letters Patent for a SYSTEM FOR CONTROLLING ELECTRIC MOTORS IN POWER TOOLS AND THE LIKE, Serial No. 226,956, was filed in the United States Patent Office on September 28, 1962, being duly sworn deposes and says; that the subject matter of the amendments filed March 4, 1964 and March 25, 1965, was part of his invention, was invented before he filed his original application, above identified, for such invention; that he does not know and does not believe that the same was ever known or used before his invention thereof, or patented or described in any printed publication in any country before his invention thereof, or more than one year before his application, or in public use or on sale in the United States more than one year before the date of his application; that said invention has not been patented in any foreign country before the date of his application on an application filed by himself or his legal representatives or assigns more than twelve months prior to his application in the United States, and has not been abandoned.

Alex F. Gawron

Alex F. Gawron

Sworn to and subscribed before me this 24th day of May, 1965.

(Seal)

Notary Public

32

Gordon:ge1
CM

PAPER NO.: 10
SERIAL NO.: 226,956 15530

REFERENCES CITED BY EXAMINER

The following references, cited by the examiner, are of record in the patented file of this patent:

UNITED STATES PATENTS

PATENT NUMBER	DATE	NAME OF PATENTEE	OFFICIAL CLASSIFICATION
2,419,431	4/47	Williams	318-212 X
3,103,618	9/63	Slater	318

FOREIGN PATENTS

PATENT NUMBER	DATE	COUNTRY
242,179	12/62	Australia

OTHER REFERENCES

(List the following items when available, page number, date, and title)

Publication: Outswiller, C.E. Application Note 200.4, 6/61, Universal Motor Speed Controls, June 1961.

33

Original

U.S. DEPARTMENT OF COMMERCE
PATENT OFFICE
WASHINGTON

15531

Paper No.: 11

Serial No.: 226,956

EXAMINER(S) NAMED IN ALLOWED APPLICATION

The examiners with full or partial signatory authority whose signatures appear upon the actions in this allowed application are named below. Their names shall appear, as given below, on the printed copies of the patent specification and claims as the final matter thereon.

ORIS L. RADER	Primary Examiner
	Examiner(s)

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ADDRESS ONLY
THE COMMISSIONER OF PATENTS
WASHINGTON, D. C. 20231

U. S. DEPARTMENT OF COMMERCE
PATENT OFFICE
WASHINGTON

All communications regarding this application should give the serial number, date of filing, and name of the applicant.

NOTICE OF ALLOWANCE

The application for patent identified below has been examined and found allowable for issuance of Letters Patent.

FILING DATE	SERIAL NO.	NO. OF CLAIMS ALLOWED	EXAMINER	GROUP
09/20/62	226956	4	O. Rader	21

APPLICANT	Gawron, Alex F.; Chicago, Ill.
ASSIGNEE	
TITLE OF INVENTION	System for controlling electric motors in power tools and the like

MAILED JULY 2, 1965

CLASS-SUB
318/345

With the allowance of the application the final fee becomes due. This fee is thirty dollars ($30) plus one dollar ($1) for each claim allowed in excess of twenty (20) and must be paid within 6 months from the date of this notice. Failure to remit the final fee will result in the patent being withheld from issue.

As a convenience in remitting this fee, use of the enclosed Form POL-85c is suggested. The final fee will not be received from anyone other than the applicant, his assignee or attorney, or a party in interest as shown by the records of the Patent Office. If no entry appears in the space labeled "assignee," above, a form is enclosed relating to the address of the inventor(s) which requires your attention.

If it is desired to have the patent issued to an assignee or assignees, an assignment, together with the fee for recording the same, must be filed in this Office on or before the date of payment of the final fee.

The patent will be issued and forwarded within approximately two months after receipt of the final fee.

By direction of the Commissioner.

Lockwood, Greenawalt, et al
38 S. Dearborn St.
Chicago, Ill.

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Patent Office

FINAL FEE TRANSMITTAL

This form is provided for convenience in transmitting final fees to the Patent Office. When properly completed it may be used as a formal transmittal letter. Respondents will note and fill in items numbered 1 thru 5 below. The Final Fee Receipt, in due course, will be mailed to the address appearing in box at lower left of this form. If desired, use of this form may be avoided by using the Notice of Allowance for carbon copy when completing this form.

1. The COMMISSIONER OF PATENTS is requested to apply the accompanying fee to the case identified below, and deliver the patent as indicated.

GREIST, LOCKWOOD, GREENAWALT & DEWEY

July 7, 1965
Date

By C. L. Fleming
Attorney, Agent or Applicant

NOTE—Final fees will not be received from other than the applicant, his assignee, or attorney, or a party in interest as shown by the records of the Patent Office. Final fees will not be applied to pending applications.

	FILING DATE	SERIAL NO.	NO. OF CLAIMS ALLOWED	EXAMINER	GROUP
	09/20/62	226956	4	O. Rader	21
APPLICANT	Gamron, Alex F.; Chicago, Ill.			MAILED JULY 2, 1965	
ASSIGNEE					
TITLE OF INVENTION	System for controlling electric motors in power tools and the like			CLASS-SUB 318/345	

2. Assignee: (If assigned and name does not appear in the corresponding space above)

SKIL CORPORATION
(Assignment forwarded July 7, 1965)

3. FEE ENCLOSED

$30.00

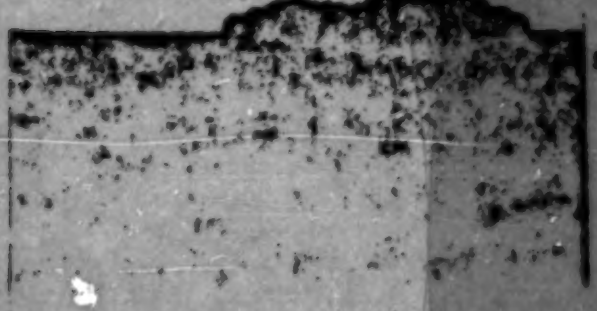
MAILING INSTRUCTIONS

NOTE—The office will send the patent to the address entered in stub at left below unless you direct otherwise. Use the space provided to indicate any changes which affect the delivery of the patent.

4. Do not send the patent to the addressee listed below. Send patent to (check one)

☐ Patentee
☐ Assignee
☐ Associate Attorney (See specific authorization ...
☐ Change of address—Attorney

The address of the person checked above is entered in item 5 below.



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A143

TO: J. Sullivan
C. Gutman
R. Christensen
J. H. Hamm
R. Antonenyk
D. Summerfield
R. Sullivan
J. Spaulding

DATE: February 6, 1964

DEFENDANT'S EXHIBIT 1

KAMAN REPORT

FROM: Frank Kaman

SUBJECT: Speed Control Drill - Trigger Type

1 As you know, the Engineering Department has undertaken the project of releasing to production a 500 Line Series of drills incorporating a trigger type speed control which allows the speed of the drill to be varied from 0 to 2600 RPM and in direct proportion to the amount that the trigger is depressed.

2 A drill incorporating this type of speed control is thought to represent innovation in the drill field because it approximates the degree of control the operator can exert on the drill. For instance, a drill having this type of speed control can be used to drill holes on curved surfaces, and with small drills without the use of a center punched starting point. It can also be used to drive a tap for threading holes in metal and it will also permit the operator to set wood screws without previously drilled hole locations.

3 The uses of a drill equipped with a trigger type speed control go beyond those mentioned above, but will not be enumerated here.

4 It is the view of the Engineering Department that a speed control, operated by a rotating knob or button and then including a standard "off-on" trigger switch, does not represent innovation or great utility in the drilling field; whereas the trigger type speed control, which is variable from zero to full speed, and in proportion to trigger depression, is the desired way to approach this problem.

5 The Engineering Department has completed six (6) complete prototypes of the 503-TS, as described under PRO-345. One of the prototypes has undergone complete testing and appears to meet our requirements. There is also the necessity of meeting U/L requirements. In preliminary discussions with U/L, we have learned that they do not have a testing category for this type of product and, therefore, would have to develop a specification before undertaking test and approval. We feel that our design meets the basic tenets of U/L requirements.

6 In the meantime, we have discovered that the Lucerne Company of Northfield, Ohio has also been active in the trigger type speed control. Lucerne has supplied us with a sample control which is embodied completely in a switch and trigger arrangement that can be installed directly in a 503 drill without any other change and give us trigger type speed control. A photo of the Lucerne switch is attached and also a report prepared by Alan Cameron listing the characteristics of both the Skil and Lucerne approaches to this problem.

7 Skil Corporation has applied for patents relating a trigger type control for varying speed in a drill in common with an SCR circuit. Our dates of discovery go back to May of 1962 and our actual application was filed in September of 1962. There is a chance that our course may precede that carried on by Lucerne and, therefore, Skil Corporation may prevail over Lucerne on this basic claim.

8 The patent situation has been discussed thoroughly with J. H. Hamm and C. Fleming of Greist, Lockwood, Greenawalt & Dewey and a decision to write to the Lucerne Company giving them

I hereby certify that this document is a true and [illegible] copy of the original

[illegible] Clerk

By: Vincent J. Marcinek
Deputy Clerk

notice of our activities in this field is expected shortly. This latter may or may not have any effect on the Lucerne plan to proceed.

9 We have been notified by Lucerne that they would be ready to supply their version of the trigger type speed control to us in approximately 2 months and at a cost of $3.00 per switch unit, based on an order of 5,000. We also know that they are proselyting throughout the entire industry for interest in their trigger control and, as a result, may be taking orders from any or all of our competitors. If Lucerne is allowed to proceed, our hopes of uniqueness of position, or innovation in this field hoped for by Skil Corp., would come to naught.

10 The Lucerne switch has undergone tests in our Lab and provokes the following comments and observations:

The switch has not shown up too well as far as endurance life is concerned and embodies several marginal stratagems in the concept of a device of this sort. Not only does it lack a positive "off" position, which we feel it must have, but it also gives a considerably poorer feeling of control due to the fact that it must contain all of its control in a 1/4" stroke whereas the Skil designed version has a 5/8" stroke. The Lucerne device obviously needs more development- if their total progress is embodied in the sample that they have given us. I would definitely not approve proceeding with Lucerne on the basis of what I have seen so far.

11 At the present time, I have a good deal of reluctance in reporting our complete results to Lucerne since, I am sure, they would contribute to their ability to develop a completely satisfactory article. I suggest that we do report need of further development to improve its life capability which we now feel is limited. I am hopeful that this would tend to slow them down a bit. I also feel that they would have trouble getting U/L approval since they do not have a full "off" position in their control. A drill can actually be lying on a table in the "off" position and be started by transient voltage in the immediate area without trigger depression. This could be a potentially dangerous situation and one that is characteristic of this type of circuit unless a switch is biased across this circuit to break contact completely. We therefore plan to tell Lucerne that we could not proceed with their switch unless they had U/L approval.

12 I further suggest that we proceed as rapidly as we can with putting our own design into production. This is based on using purchased components and tying them into a mechanical design such as we propose. This is a more expensive way to proceed than the Lucerne way and does not have the advantage of fitting interchangeably into a drill, but it does work most satisfactorily and would get us in the market in the least possible time. Thus, it gives us the best chance to secure innovation.

13 However, if Lucerne goes ahead and puts out a workable design at about the same time that we have ours ready for the market, and if we cannot delay them because of the patent and U/L situation, our position would not be unique. Additionally, there is some tooling cost involved in our design which could, in effect, be lost if Lucerne prevails and enters the market at about the same time we do.

14 There may be others, as yet unknown who are making plans to proceed on this idea.

15 The Engineering Division has a new proposal which would embody the type of speed control that we feel is desirable, into a package that would be very similar to a typical switch. This idea is based on our work and also would be somewhat similar to the Lucerne switch. In effect, we would be making a speed control switch, trigger and all. I have asked the Research Department to investigate this new design from the standpoint of the total cost of getting into business. This would represent,

page three...

perhaps, the cleanest and cheapest way to go ahead, but unfortunately, this approach does not have a completely predictable release to production date and, in addition, it would entail an approximate 6 month period to complete tooling for production. Therefore, the Engineering Division will finalize this proposal first, and seek direction when this is done.

16 In reviewing the entire proposition, we have secured a Dun & Bradstreet report on the Lucerne Company and we note that they are a small manufacturer located in Cleveland, Ohio. The Dun & Bradstreet report has been circulated previously. As far as we know, Lucerne is the only company showing an approach similar to ours in the speed control field and we feel it is based on fairly basic thinking by their organization. Lucerne also has other items in the low cost switch field that appear to be attractive and should be given consideration by all portable power tool manufacturers. So far, we have not approved any Lucerne switches for use in Skil tools because they have not passed our performance requirements but we do feel that they have some good ideas.

17 I propose that we give consideration to an effort to acquire Lucerne, since we feel that their potential for profit is promising in other areas as well as the speed control switch. Their type of operation requires a high content of die-made parts and practically no precision unit operations. This means that once proper tooling is developed, unskilled labor can be used to complete the assembly operations. This all means that this type of operation can fit in very well with our Florida capability.

18 In addition, the Engineering Division has on its future products docket, the development of a truly sealed high capacity switch, based on the sealed mercury tube principle, but has never found time to complete this development. We feel this development can have great significance in upgrading the present level of our industrial tools, such as, our worm drive saws. The switch is recognized as the weakest part of this entire design.

Therefore, the potential that resides in the Lucerne Company could be put to greater use in improving the overall capability of any of our present products.

Donald B. Rowe
Vice President

PKimes

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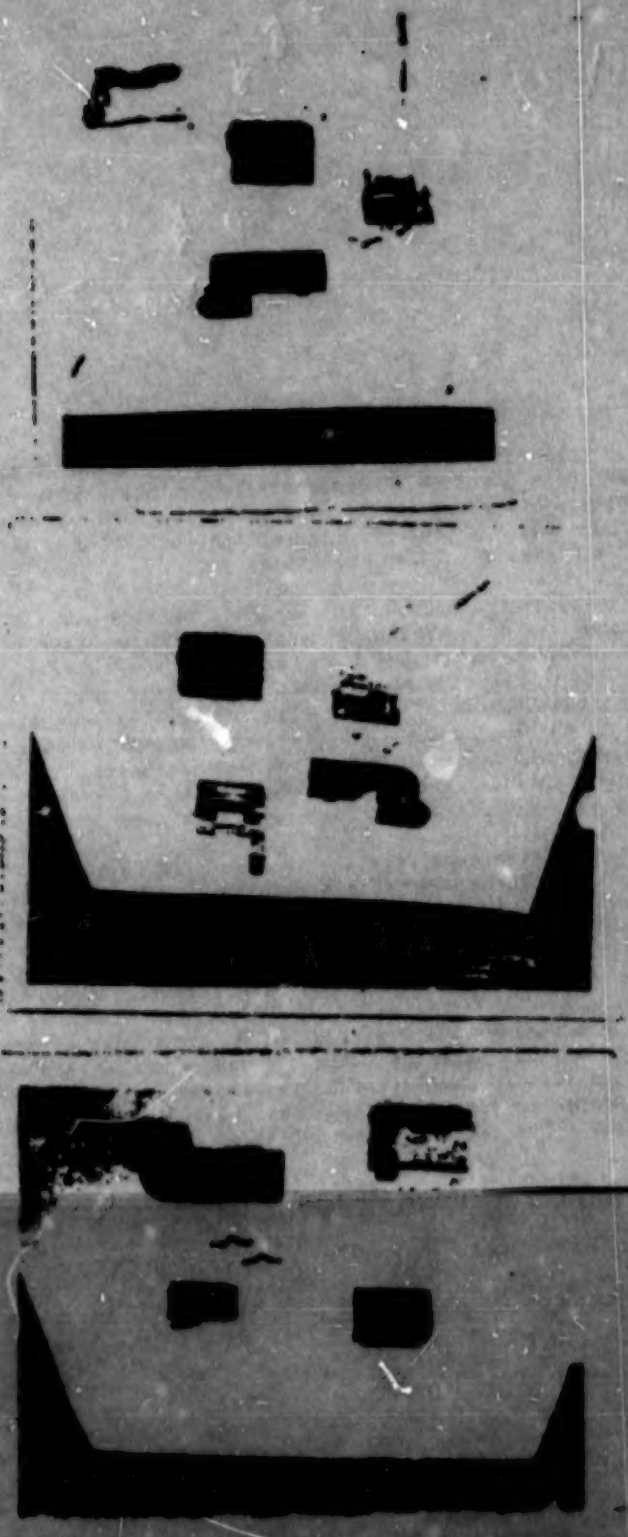

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A147

SUBJECT: Speed Control Drills - Lucerne Switch Company

KAMAN REPORT

DATE: February 20, 1964

FROM: Frank Kaman

After considerable study which involved an investigation of many different methods of achieving a satisfactory trigger type speed control drill, there is no doubt that joining forces with the Lucerne people could lead to the most simple and least costly method for achieving our objective.

While the Lucerne approach at this time appears to have several shortcomings, nevertheless, it is my opinion that these can be worked out rather quickly and satisfactorily and, therefore, this approach would also lead to the earliest introduction date.

Since this is a new concept, U/L approval is something that will have to be worked for. It is my opinion that approval can be worked out but that some negotiation will have to be entered into, especially since U/L does not now have a specification or exact category for describing requirements or exact test procedures. The question of marketing initially without U/L approval should be raised with our marketing people and adjudicated.

I have not altered my personal opinion throughout this entire development - that trigger type speed control definitely provides innovation in the use of a conventional 1/4" pistol grip electric drill and, therefore, should have considerable sales appeal and prestige value. With this thought in mind, we have personally been engaged in the attempt to win this advantage for Skil Corporation exclusively. The financial significance of this feature and its desirability and, therefore, the extent of Skil Corporation's real interest in this must, in the final analysis, be concurred in by the Product and Sales Departments.

At this time, I am not aware of efforts by other people to introduce trigger type speed control, with the exception of the Lucerne Company, although it could very well be that other are working toward the same end.

By proceeding independently, the Lucerne people certainly present considerable challenge to our hope for exclusive possession of trigger type speed control if they are allowed to continue on their present path.

At this time, our patent position affords some encouragement as to the novelty of our own efforts, since we do carry our own concepts back nearly two years, and our two patent applications back to approximately one and one-half years. The essence of our patent position is to try for claims that relate the capability to vary speeds in proportion with trigger depression and in connection with an SCR circuit contained in the handle of a tool. At this time, we do not have positive assurance as to the breadth of coverage that we will be able to secure but, at the same time, there is no reason to downgrade the originality of our efforts. We should use the patent situation to the full extent of its bargaining power.

We do not need Lucerne in order to get into speed control drills. Our own efforts will lead us to a production release very shortly, but our device can not be installed in any 503, 510 or 541 that we have ever made, whereas the Lucerne approach does have this capability. If we proceed on our own, and Lucerne proceeds with their present plans, no portable tool manufacturer will have an exclusive position.

Therefore, with the above in mind, it would be a good idea to set down the avenues of approach that can be made to the Lucerne people. The possibilities are listed in order of severity of attitude.

1. Give them a definite order for a large enough number of units so as to saturate their production and extract from them an agreement to sell to Skil Corporation exclusively for a certain period - for instance, six months before they make it available to the rest of the industry. Their initial quotation to

I hereby certify that this document is a true and

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By Lawrence F. Mancuso
Patent Dept.

DEFENDANT'S EXHIBIT 2

us included a requirement for a 5,000 unit quantity at $3.00 per speed control switch unit. They say they can deliver in approximately 5 to 8 weeks. This unit can be fitted into a standard 503, 560 or 541. While they have shown this to many of our competitors, and indicate that wide interest has been expressed, they had no definite orders as of last Monday afternoon. Specific benefits of working with Skil Corporation would be the provision of a highly respected and acceptable "showcase" for their product, aid in developing specifications that would be acceptable to U/L, world-wide patent agreements and sales possibilities, etc.

2. As a further inducement to Lucerne to grant us exclusive production, we can offer to give them all of our standard 500 Line drill and saw switch business. This would amount to a total of 175,000 switches per year in two different trigger styles. Lucerne does not have any of our business now and, therefore, could secure Skil business as a new account. These switches are standard with them now.

3. During Mr. Matthews' proposed visit of Friday, February 21, 1964, I intend to discuss some of our efforts in speed control. I will show him our first trigger type SCR unit and tell him that we have had it around for over two years. I will also show him our 503 speed control drill, this includes our latest efforts. I will not show him the speed control mechanism in the 503, however. I also plan to show him our mechanical governor equipped speed control drill. By this procedure I hope to establish in his mind the fact that we have made serious efforts to get into the trigger type speed control over a considerable length of time and, therefore, can back up our statements of early patent application. We can inform him that we have two patents on file that date back several years and indicate that trigger type speed control, in combination with an SCR circuit, is the broad description of our patent efforts. Having established this, we can offer to join forces with him in making a speed control largely to his design but with some of our specifications included and, in return for his co-operative effort, express a willingness to grant him a license on our patents when they are issued. The terms of the license could be from free to the standard 5%. We then, in turn, would encourage him to sell as much of his output as he could to others at the expiration of the exclusive period with us.

We can leave the impression with him that because of our prior work having potential patent security, that unless he joins forces with us in completing the development, he may find himself in risky legal circumstances.

4. We can pursue the question of acquisition further and thereby acquire exclusive possession of their speed control. I would not seriously recommend acquisition just for this purpose alone. A complete profitability survey must be made prior to developing this approach.

5. If Mr. Matthews does not indicate acquiescence on the previous 4 points, we can put him on notice officially as to our own patent efforts and, in effect, threaten his efforts while, in the meantime, releasing our own design for production.

It should be pointed out that our design can not be used in previously manufactured 503, 560 and 541 drills since minor casting changes are required. Our design does have some advantages over his design, which we hope he would adopt in his design if we proceeded on an agreement. We face the necessity of expending approximately $3,000 for tooling before we can proceed.

We could also develop an integral switch design of our similar to his but this would take approximately 4 to 6 months and would entail the expending of approximately $7,000 to $10,000 for tooling. We would then, in effect, be in the switch business.

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And, again, unless we are able to shut Lucerne off, we would lose the exclusive aspect of this development.

My thoughts on the acquisition of Lucerne and their outward appearance are contained in a concurrent report.

Frank Kaman

FK:mas

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A150

INTER-OFFICE COMMUNICATION

GAWRON REPORT

TO: R. W. Christensen DATE: February 11, 1964

FROM: A. F. Gawron SUBJECT: Speed Controlled Drill R-1123

Lucerne Control

Lucerne, a small switch manufacturer, has submitted a speed controller for our evaluation in a Model 503 Drill. The controller looks exactly like the common trigger switches which are used in our drills. In operation the controller functions as follows, when the trigger is pulled:

> Tool turns on at 150 RPM, speed increases smoothly to 2010 RPM, and then speed jumps to 2790 RPM. In the first part of this cycle speed is controlled by controlling 1/2 wave power to the motor, then at trigger full back the control switches the motor to full line power, by-passing the electronic components.

The electronic components of the controller are:

1. Silicon controlled rectifier.
2. Capacitor.
3. Neon bulb.
4. Film type rheostat.
5. Switch for full power operation.

The price of the control was verbally quoted at $3.00 in 5,000 quantities.

The advantages of this control over our present approach to this design problem are:

1. Fits in drill without casting changes.
2. Easy assembly line wiring.
3. Has full wave position which means no change required in motor.
4. Can be sold for existing tools.
5. No SKIL tooling required.

The disadvantages are:

1. Lacks positive "off" switch.
2. Short stroke (¼") does not give as good a feeling of control as the SKIL design (5/8" stroke).
3. Needs more development.

The first two disadvantages would be difficult to overcome since they have modified a standard switch and are subject to the limitations of that switch.

The switch also had locking positions for four different speeds.

The unit we evaluated was hand made, indicating tooling is not yet available.

DEFENDANT'S EXHIBIT 67 CA-14-CFL-21

The basic approach of Lucerne is very good in that they are designing a compact package, using the linear action of the trigger to operate the switch and rheostat directly.

Test Results

The Lucerne control was subject to the following tests with a Model 503 Drill and compared with the SKIL designed 503 Drill.

A) No-load speeds -

150	RPM	lowest speed		
1400	"	trigger lock	"	#1
1860	"	"	"	#2
2010	"	"	"	#3
2790	"	"	"	#4

Control is smooth from 150 to 2010 RPM then jumps to 2790 RPM.

SKIL design is adjustable from 0 to 2640 RPM. No locking positions on SKIL design.

B) Drilling -

1/32" drill in steel without center punch. Both drills started holes accurately. However, the SKIL tool had a slight advantage due to a better feeling of control.

C) Drilling -

1/4" drill in steel. Both tools were used and were about equal in performance. Tools were run at an intermediate speed setting and drew about 3.6 amperes R.M.S.

D) Screwdriving -

#10 screw 1" long in fir without pilot hole. Tools performed about equally except that SKIL had a slight advantage in feeling of control.

E) Load test -

40 seconds idle, 20 seconds load (2.0 amps D.C. at 1100 RPM) 450 cycles completed. This was an intermediate speed setting and both tools passed this test successfully.

F) Switch cycling -

Trigger cycled on and off 16 times per minute, tool at no-load. Both tools have passed the 5,000 cycle point. The SKIL unit is still on test and operating satisfactorily. The Lucerne unit was disassembled after 5,000 cycles. Examination revealed that the carbon film on the rheostat was almost worn to the point of failure. However, this is not conclusive since we do not know the state of the controller when it was received here. Also the step settings in the trigger were worn beyond usefullness. Otherwise the control seemed to be functioning alright.

The Lucerne control with its by-pass switch, of course operates the motor at full power when set at maximum speed. The SKIL design, which uses half wave power at full speed, has speeds and power points as follows:

No-load speed	-	2640 RPM	(2800 RPM 503 T-6 std.)
Nameplate torque	-	2100 RPM	(2160 " " " ")
Maximum power	-	.182 H.P.	(.204 H.P. " " ")
Stall torque	-	42 oz.ft.	(50 oz.ft. " " ")

Temperature rise on the SKIL half wave motor is equivalent to the standard 503 T-6 motor.

SKIL Control

The original assumption for the SKIL design was to keep tooling costs to a minimum, hence the use of off-the-shelf items for the rheostat and the snap switch. Within this limitation our design proved to be very good. However compared to the Lucerne control, the SKIL design is more bulky, has more total parts and, considering large quantities, is inherently more expensive.

If we were to change our approach to the point of designing a complete package with a switch and rheostat of our own design, then we can achieve a package similar to the Lucerne design and also overcome its shortcomings. The important question here is; can we justify the tooling cost for a complete package design? If this idea of control becomes popular (I believe it will), then we will have to be talking about a more economical design than we now have. Neglecting tooling cost I foresee a control which could add up as follows:

Package with trigger switches and rheostats	$ 0.40
Silicon controlled rectifier, 4Ka	1.22
Capacitor	.10
Neon bulb	.10
	$1.82

People in the rectifier business foresee a price of $0.75 for the SCR eventually. This would bring the SKIL cost down to $1.35 for a speed control package.

A sketch is attached showing the basic moving electrical parts necessary for this special design. This scheme would provide a positive off switch, a rheostat, and a by-pass switch for full wave operation.

SKIL control vs Lucerne control

Reason for SKIL control design - exclusive design. By keeping design in our own Engineering Department, we can move faster and keep competition in the dark about the approach we are taking. By keeping the design here we would not be helping Lucerne in the further development of this control. Lucerne has not demonstrated any special "know how" or engineering talent that we do not possess here. By keeping design here we can gain more knowlege on these controls which should be useful in future products.

Reasons against SKIL control design - Would consume additional Engineering man-hours. SKIL would have to assume tooling cost.

Conclusion

The writer recommends we evaluate tooling cost necessary for a new trigger control design and estimate additional time to design same.

A. F. Gavron

A. F. Gavron

AFG:eh

cc: F. Kaman
D. Summerfield

EXCERPT FROM TRANSCRIPT OF PROCEEDINGS

[1061] RE-CROSS EXAMINATION OF ALEX GAWRON

By Mr. Egan:

* * * * *

[1062] Q. Let me ask you, Mr. Gawron, has any competitor to your knowledge at Skil ever seen your Plaintiff's Exhibit 4 in commercial use?

Mr. Fleming: That question is obviously improper. The testimony is clear that Plaintiff's Exhibit 4 was not in commercial use.

Mr. Egan: Let the witness answer.

The Court: Objection denied.

A. I hope not. I don't know that one has ever [1063] seen it, but I hope one never did.

Q. And after all, it was only that device of Plaintiff's Exhibit 4 that was in existence at the time you filed your patent application again? A. Which application are we talking about?

Q. Your patent application, Plaintiff's Exhibit 1, the Gawron patent. A. The September '62 date?

Q. Yes. A. That was the only embodiment of the invention at that time.